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NATURAL HISTORY

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THE NATURALIST

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Principally for the North of England

Edited by
W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
with the assistance as referees in special departments of

R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., F.G.S.

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THE YORKSHIRE NATURALISTS' UNION

ENTOMOLOGICAL SECTION
NOTICE OF MEETINGS, 1967

Saturday, 11th February

There will be a meeting of the Section at 2.30 p.m. at Doncaster Museum at the invitation of the Director, Mr. E. F. Gilmour. The meeting will follow the usual pattern of exhibits and notes and members are particularly asked to contribute to this. There will be an interval for tea and refreshments can be obtained at the Museum's cafe.

It is hoped that members will take this opportunity of visiting the new Museum and seeing its collections.

Preliminary announcement

Arrangements are being made to hold a joint meeting with the British Trust for Entomology on Saturday, 22nd April. It will take the form of a symposium and will be held at the Huddersfield Museum by invitation of the Director, Mr. E. W. Aubrook. Details later.

P. SKIDMORE,
Hon. Secretary, Entomological Section,
Museum and Art Gallery,
Chequer Road, Doncaster.

ORNITHOLOGICAL SECTION

Preliminary Notice. The Ornithological Section, in conjunction with the Bradford Naturalists' Society, is arranging a public lecture by George Waterston, the regional officer of the R.S.P.B. for Scotland, in the Connaught Rooms, Manningham Lane, Bradford (opposite Busby's) for 7.30 p.m. on Friday, 10th March, 1967. The subject of the lecture will be 'Expedition to Greenland' which will be illustrated by colour slides and tape recordings.

SPURN BIRD OBSERVATORY. Separate Report for 1965 now available. Copies obtainable from the Warden or J. K. Fenton, Moor Cottage, Moor Edge, Burley-in-Wharfedale, 3/6d.

BRITISH MUSEUM
2 - FEB 1967
NATURAL HISTORY

THE NATURALIST

FOR 1967

A MYCOLOGIST'S VIEW OF NATURAL HISTORY

N. F. ROBERTSON

Department of Botany, University of Hull

Presidential Address to the Yorkshire Naturalists' Union, Hull, 3rd December 1966.

I count it a great honour to be President of the Yorkshire Naturalists' Union, especially when I look back at the many distinguished scientists who have held office before me and realise the extent of their contributions to Natural History. In considering what I should say to you this afternoon I am aware how wide my own interests in Natural History are and how few my achievements. I am also aware that, in contrast to many of our Presidents, I am a resident Yorkshire naturalist closely associated with the naturalists of the East Riding and as such may be permitted a certain amount of introspective appraisal of our Union on your behalf. I do not propose that we should look back, as we might well do with pride, but rather that we consider what the function of the Union may be in the changing world of the next 50 years or so.

What do we do at present? First of all, and this is very hard to say without sounding fulsome, we enjoy the countryside and the plants and animals, rocks and waters to be found in it. This aesthetic appreciation is the common bond which keeps our varied interests together. Each year, in our single or several societies, we visit the far corners of our territories and exchange information about the interesting features with one another, so that through the years our members become living repositories of information about the area in which they live. We do not stop at mere appreciation of our surroundings; we record each year what we see, and where, in the pages of *The Naturalist* so that as time passes we write a history of the natural world of our area. Moreover, we make a synthesis from these observations, we draw deductions and make experiments and add useful digested information to the records in *The Naturalist*. Do you want to know which whales have been seen in the Humber, how the Collared Dove invaded Yorkshire, what Spurn Point looked like a hundred years ago, or about the history of plant collecting in the East Riding? All these and many other subjects are treated with scholarship in the pages of *The Naturalist*.

This you might think was a reasonable list of achievements; there can hardly be a bird that flies or a flower that blows in the whole of Yorkshire that is not known to the members of our Union. But the world is changing and this record, more than adequate for the present day, may not match the needs of the future. The first point on which we may be failing is in the education of our younger members. With the increase in biology teaching in the schools and the stimulus of the magnificent television treatment of Natural History, more and more boys and girls are turning to us for the fulfilment of their interests. What are we doing for them? I can perhaps illustrate this from my own experience as a mycologist. It is no run-down group that studies fungi in Yorkshire. We can boast at our meetings some of the best amateurs and professionals in the country and in looking through the Union's publications we can see that many distinguished British mycologists have written for us or have been Yorkshiremen to begin with. Any enthusiastic beginner is welcome at our forays and will get any help and advice he needs. But we are a high-powered group who discuss the limitations of the genus *Naucoria* or the difference between species of *Rutstroemia*; we have to be, for our field outings are times when we can learn from fellow experts. But I sometimes think we must be frightening for the very beginner.

I have learned about fungi from many eminent mycologists. My first teacher was Malcolm Wilson who bubbled with enthusiasm for all the tribes of the fungi, but who would not look at an agaric unless it grew on a tree, because, as he said "they don't do anything"; by that he meant that we knew little of their ecology to help us in our understanding. The next was F. T. Brooks, a great pathologist who enjoyed the study of agarics, but who became famous for absconding from a foray to go to a circus. He initiated me into the study of the Agaricaceae the hard way, by making me conduct a foray for students, while he brought up the rear correcting my mistakes. Miss Elsie

Wakefield at Kew helped me greatly at this time by telling me that it took seven years of learning and forgetting the names of toadstools before they became fixed in the mind. Two other great systematic mycologists, E. W. Mason and E. J. H. Corner, finally put me in the right frame of mind to enjoy fungi by demonstrating that it was possible to know them by their habitat as much as by their gills or asci and spores or colour. But none of these great mycologists found fungi easy and I mention them not to demonstrate my connections but to emphasise how difficult fungi are to get to know and to ask if we are right in our approach to the young mycologist. At the moment we invite him to a foray and send him home with a headache. We all like to be expert and are reluctant to show off our ignorance so that we put up a front which frightens the tyro — with the best of intentions.

Now I have used mycology as an example and looking around at my mycological friends I think I have painted too black a picture. What I am trying to say is that in all branches of biology and natural history we have not yet evolved a code of teaching which grades the approach. There is therefore no easy entrance for the new recruit. We could perhaps begin by admitting that our own subject is difficult, whether we study fungi or snakes, mosses or amphibians. Can we overcome the beginner's difficulty by running teaching forays where we deliberately look for generic differences only or where we examine in detail the species of one genus, ignoring all others that come to our notice? Perhaps we could help him even further by publishing simplified keys of varying grades and by producing more and better reference books. Now these are not novel ideas; all mycologists know A. A. Pearson's keys to the genera *Boletus*, *Lactarius*, *Mycena* etc. and P. D. Orton's key to *Cortinarius* which are designed to help the beginner. In fact this simplification is too comprehensive and what set out to help the beginner has become a necessity for the semi-expert. We have to descend to grades of simplicity beyond our present contemplation to get the beginner started on the slow upward climb to expertise.

But suppose we succeed in recruiting many more mycologists (or students of other groups), what do we do with them? Some will be happy to become pure taxonomists, but others will become frustrated if they learn to recognise fungi to no purpose. They need to be given work to do — we need an organiser of research for the amateur. All could help towards a rational distribution map of British fungi, a project which is progressing slowly because of the limited number of people available. The fillip given to flowering plant taxonomy by Walters & Perring's Distribution Maps Scheme has been very great indeed. Many other possibilities of co-operative research spring to mind which need doing and which would serve as a training ground for those who would eventually like to find problems and solutions for themselves. These problems could be tackled without apparatus and would be open to all. But why should we assume that the field naturalist will always be without apparatus? The golfer and the fisherman probably spend more on equipment than one would on a good second-hand microscope. The old laboratory impedimenta are no longer needed. The pressure cooker replaces the autoclave, the media in tablet form replace the complex kitchen procedure. Once the amateur mycologist admits culture techniques his field of interest becomes immeasurably wider.

I have tried to analyse the problems of popularising the study of a group like the fungi from my own experience. Let me turn aside for a moment and look at the productivity of our society in terms of the articles in the last 25 issues of our journal *The Naturalist*.

In the table the subject matters of all the articles are listed in order of numerical importance. Whatever the deficiencies of this analysis it is abundantly clear that there is an intense interest in birds in the Union. There are many possible reasons for this: perhaps the personality of such as Ralph Chislett, or our proximity to one of the great observation stations of migration at Spurn Point. Fortunate as we may be in Yorkshire the situation here is only a heightened reflection of the countrywide situation. Birds are the success story of Natural History. We must try to learn the secrets of success from ornithology. It may lie in the real attractiveness of birds or the attractive regions in which they are to be sought; but none of us would admit that they have any advantage over our chosen group in this respect. It may be because the early work on bird behaviour, which was of very high scientific calibre, was done by people of the ability of Julian Huxley, Stuart Smith and E. M. Nicholson. It may be because of the small numbers of bird species and their comparative ease of recognition. It may be because the ornithologists are better organised than the rest of us, or that they have introduced a more scientific content or a better system of evaluating identifications and population counts. Probably the success of ornithology is for all the reasons mentioned, but particularly for the last three. In my view the ornithologists have shown us an example in that the amateur is allowed to share in a professional expertise and they have so organised things that there is a developing purpose in even the simplest observations. I greatly admire the system of field identification used by the ornithologist which has all degrees of tolerance from the precision of the museum identification, through confirmatory sightings by several field experts down to the single view by the expert or the tyro. They are all made use of in the building up of records. Moreover, and I promise to end my eulogy after this, the ornithologists have devised methods of measuring populations and of conducting accurate field population studies by means which are of limited sophistication and in which everyone can take part. Would it be too much to suggest that here we have some of the elements of organisation and outlet which I suggested were needed for the development of other branches of natural history?

TABLE I

Analysis of the distribution of subject matter in articles written in *The Naturalist* from Nos. 873–898 (1960–66).

Category	*Number of articles*	*Percentage*
Reports	53	27
Birds	42	22
Invertebrates	18	9
Mosses and Liverworts	15	8
History	11	6
Conservation	13	7
Fungi	10	5
Flowering Plants	9	5
Mammals	6	3
Fishes	4	2
Amphibians	2	1
Algae	2	1
Ecology	2	1
Hydrology	2	1
Reptiles	1	½
Animals in general	1	½
Taxonomy	1	½
Pollen analysis	1	½
Fossils	1	½
	194	100%

I have been talking rather loosely about the relationship between professional and amateur. Let me expand on this. Last century the experts in the local flora were likely to be the University teachers of Botany. The Professors at Aberdeen were well-known for their arduous exploration of the arctic-alpine flora of Scotland. The younger Hooker could walk through the Himalayas and recognise most of the plants he met. Such people can be found today in the ranks of our own Union, but they are rarer than in the past because of the growth of the subject and the many diverse fields which it now covers. Each of us, amateur or professional, finds that his own chosen field leads him to an ever increasing specialisation at the edge of the subject. Each of us is stimulated by difficulty and once we have seen our way through a problem we tend to seek something requiring greater effort and more sophisticated apparatus for its solution. Here I would claim is the only significant difference between the amateur and the professional, that the latter has access to more complicated equipment. The professional should know what problems need to be tackled, what questions need to be asked and how they should be asked. He should come more quickly to the point of asking the right question for he has had full time to devote to learning to ask. In the nature of things the amateur comes more slowly to this point but once he gets there he is the equal of his professional friend. Moreover, human beings are so made that we find people who never learn what questions to ask and others who are natural geniuses whether they be professional or amateur. I make these points to suggest that in Natural History the highest scientific rewards are open to the amateur if he learns to ask the right questions.

It is this co-operative spirit between amateur and professional that we must promote, so that the professional and mature amateur help the beginner to get started and the amateur takes over from the professional the task of filling in information and developing a body of regional data which will be of real utility. Take the early history of vegetation in Yorkshire; professionals are few, our information is fragmentary, there is some written evidence, the area is rich in recent fossilised remains of which only those fully developed from the point of view of the pollen analyst have been examined in detail. There is thus a rewarding field here for an amateur and the possibility of the development of work right at the forefront of botanical–geological research, but it is clear that the professional could help in the beginning of the problem.

Now I can see some heads shaking. What is this brave new world of semi-professional science that is being suggested? Where is the old independence and self-sufficiency which we so much appreciate? My answer is that it is still there but that a further purpose is given to our work. And indeed I believe that in this shrinking world each square foot of the earth's surface which is sequestrated from food production for natural history purposes will have to be thoroughly justified by detailed biological information which can only be obtained by the intensification of effort I have suggested. That brings me to my last point this afternoon — conservation.

We here on Humberside are at the very forefront of the modern conservation problem, for on this river frontier between the Yorkshire naturalists and the Lincolnshire naturalists, man-made developments are in train which will decimate the region's Natural History. We cannot stand in the way of these developments which, in the present state of our knowledge of economics, require the consumption of land and the driving of industrial wedges into our unspoiled countryside for economic growth to take place. But we must hope that we can control the position of the developments so that they do the least possible damage to the area, biologically, geologically and scenically. For this we need knowledge, more knowledge than we at present possess. When the Yorkshire Development Report was being prepared I trembled lest I be asked to give evidence on the biological potentialities of the Humber, for collated information does not exist. It exists in fragments and in quantity in the minds of people present in this room, but that is all. Look carefully at the pages of this Report and you will scarcely find the Humber mentioned for its biological potential. There are not so very many of us and time is short. We need more people on the ground, and we need among our numbers industrialists who have been converted to Natural History, for only such men can speak with authority to their brother industrialists when it comes to an argument over a problem in conservation. I must not fail to pay tribute to our friends in the Yorkshire Naturalists' Trust who have saved many fine areas for us, but they need our detailed knowledge to enable them to pursue their work.

With education, co-operation and conservation built in to our programme for the future, we can go forward in the hope that the Yorkshire Naturalists' Union will have as successful a future as it has a past.

The Voyage of the Beagle by **Charles Darwin,** edited by Millicent E. Selsam· Pp. xxiv+326. World's Work Ltd. 30/-.

That Darwin should ever have sailed in the *Beagle* was a somewhat fortuitous event for he had no academic qualifications as a biologist and his interest in natural history was that of an enthusiastic amateur. How the voyage shaped his whole subsequent life and how that in its turn reshaped the whole of subsequent biological thought is common knowledge. There was never a better instance of the right man being in the right place at the right time.

For the general reader, the original edition of Darwin's "Journal" was overloaded with detail and abridged versions have kept the continuity of events without sacrificing the sense of his growing powers of observation and creative reasoning. This version is less than half the length of the original and it differs from previous versions by each chapter being prefaced by a short introduction referring to the significance of the events recorded. There is also an introduction which records the events which led up to Darwin's sailing in the *Beagle* and his relations with Captain Fitzroy. The maps provided at the beginning of each chapter and Anthony Ravielli's drawings are welcome additions to the text. W.A.S.

RECREATIONAL USES OF RESERVOIRS

R. F. Dickens

Most members will already be aware that a joint circular has been issued by the Secretary of State for Education and the Minister of Land and Natural Resources on the Use of Reservoirs for Recreation. At its April meeting the Y.N.U. Executive asked the Ornithological Section to consider this problem and ways of meeting a possible threat to wild-life should indiscriminate use of reservoirs for water-sports become an accepted practice.

It will readily be appreciated that an appeal to local societies for opinion would inevitably have resulted in their stressing the importance of their own local waters. It was deliberate policy, therefore, to take the advice of the vice-county ornithological recorders as being those best placed to judge the comparative importance of the various reservoirs. We felt that it was not only reasonable but also politic to ask for the preservation of only a few reservoirs of real county importance, and indicate no objection to the use of a larger number, less important county-wise though perhaps considered locally rewarding.

A copy of the ensuing letter and lists has been sent to each County Planning Officer and to the Water Boards whose reservoirs we feel should not be opened for water-sports. The Y.N.T., Nature Conservancy, Council for Nature, Wildfowl Trust, W.A.G.B.I. and the Fisheries Officer of the Yorkshire Ouse River Board have also received copies.

It should perhaps be pointed out that some of the waters in the second schedule would probably not be considered suitable for water-sports in any case; and that there is already evidence that some water-boards are coming down firmly against unrestricted facilities being granted at their reservoirs. The Chairman of the Tees Valley Water Board, for instance, has been quoted as telling the Minister for Sport that they are "very, very unhappy about the plans". They have said that powered boats "mean oil and oil means health hazard". They are anxious about the cost of providing facilities — access roads, parking areas and toilets would be needed. They are wondering who would be held responsible for any dangers implicit in the scheme — the dangers from silt when water-levels are low and dangers to health. Their own employees are required to have medical certificates proving they are immune from typhoid but sportsmen would need no such certificate. It was also pointed out that coastal and estuarine waters provided easier and quicker access for the main centres of population concerned and established sailing clubs already existed there.

There seems little doubt that a vocal minority will continue to urge the opening up of the reservoirs. At least we have asked that our interests should also be considered. I was a little disappointed that in the course of duplication a sentence from our suggested draft was omitted. "Additionally", we said, "there are many people who find the peace and quiet prevailing at these areas a re-creation in itself, and their point of view should not be forgotten".

Dear Sir,

RECREATIONAL USE OF RESERVOIRS

The Yorkshire Naturalists' Union is concerned about the effects on wild life if the current campaign for wider recreational uses of reservoirs and other waters should result in unlimited facilities being granted indiscriminately.

Knowing that their wider use is being advocated, even at Government level, we would like to request that our views — as representing that of 600 individual members together with the membership of 41 affiliated local natural history societies — should be borne in mind in any discussions on such possible developments at reservoirs within our county.

We appreciate that all types of interests must be catered for but feel that the interests of some should not be lightly sacrificed entirely to the water-sports enthusiasts who may be more organised and vocal but still somewhat of a minority. A large body of naturalists covering many aspects of natural history have found recreational and educational value in these areas and over a long number of years have been observing and recording the birds and other wild life of Yorkshire reservoirs and other waters which, because public access has been limited, have become, in many cases, wild life sanctuaries in all but name.

Having given the problems arising our careful consideration, we feel that there need be no real conflict and that the requirements of the water-sports enthusiasts could be met without serious detriment to our interests as naturalists, without serious disturbance to wild life and without completely destroying the peaceful atmosphere which so many enjoy. To ensure this it would be necessary to continue the present restrictions on the use of some reservoirs.

Not all waters are of equal significance to birds which may use them as roosts during the winter, as breeding grounds during the summer months or as feeding and resting places during times of migration. We have therefore prepared two lists one detailing those which have great ornithological and scientific importance where any lifting of restrictions on recreational facilities would seriously interfere with wild life, and a second one naming those waters which from a county point of view are less important ornithologically and where we would not be so concerned by the granting of water-sports facilities. From our observations made over a number of years we consider that those in the first list should be granted at least unofficial status as wild life refuges although we would prefer their recognition as sanctuaries.

A copy of this letter has been sent to all the appropriate water boards who administer the reservoirs mentioned in the first list.

Yours faithfully,
DONALD F. WALKER,
Chairman, Executive Committee, Y.N.U.
RALPH ATKINSON,
Hon. General Secretary, Y.N.U.

Schedule One: Yorkshire waters of ornithological importance which the Yorkshire Naturalists' Union feels should be kept free from water-sports and maintained as unofficial wildfowl refuges or even recognised sanctuaries.

WEST RIDING:
Stocks Reservoir. (Fylde Water Board, Sefton Street, Blackpool).
Malham Tarn.
Gouthwaite Reservoir. (Bradford Corporation Waterworks, George Street, Bradford 1).
Fairburn Ings Nature Reserve.
Eccup Reservoir. (Leeds Corporation Waterworks, 182 Otley Road, Leeds 16).
Fewston Reservoir. (Leeds Corporation). Of the four reservoirs in the Washburn Valley we feel that at least one, preferably Fewston, should be preserved for wild life.

NORTH RIDING:
Leighton Reservoir. (Leeds Corporation).
Scaling Dam. (Tees Valley and Cleveland Water Board, Corporation Road, Middlesbrough).
Summerlodge Tarn.
Locker Tarn.
Castle Lough (Crag Pond) Lartington.

EAST RIDING:
Tophill Reservoirs (Hull Corporation Waterworks, Guildhall, Hull).
Hornsea Mere. No extension of present use, as ski-ing and motor boats would disturb wildlife on the private part of the mere.

Schedule Two: Less important reservoirs and other waters from a *county* ornithological view-point. The Yorkshire Naturalists' Union would have no real objection to recreational activities on these.

WEST RIDING:
Chelker Reservoir.
Grimwith Reservoir.
Scar House Reservoir.
Angram Reservoir.
Ardsley Reservoir.
Fly Flatts Reservoir — already used for sailing.
Wintersett Reservoir — already used for sailing.
Southfields Reservoir — already used for sailing.
Ingbirchworth Reservoir.

Bardon Moors Reservoirs.
Worth Valley Reservoirs.
Wadsworth Moor group of Reservoirs.
Heptonstall group of Reservoirs.
Lindley Reservoir
Swinsty Reservoir
Thruscross Reservoir
see first list. We feel that at least one of the four Washburn Reservoirs should be preserved for wild life.
Beaver Dyke Reservoir.
Scar Gill Reservoir.
Lumley Moor Reservoir.
Knotford Nook Gravel Pits — already used for sailing.

North Riding:
Hury and Blackton Reservoirs.
Roundhill Reservoir.
Grassholme Reservoir.
Balderhead Reservoir.
Selset Reservoir.
Semerwater — already used.
Bolton-on-Swale Gravel Pits — already used.

East Riding:
Welton Ponds — already used.

CHISLETT MEMORIAL LECTURE 1966

The second Chislett Memorial Lecture was given on Saturday, 8th October, 1966 in the Rotherham College of Technology. The speaker was N. W. Moore, Esq., PH.D., M.A., Head of the Toxic Chemicals and Wildlife Section of the Nature Conservancy Experimental Station at Monks Wood. There was a good attendance of members representing fifteen local Societies on this very pleasant and fitting occasion when the Memorial Lecture was held in the late Ralph Chislett's home-town. It was made even more so by the fact that Mrs. Chislett was present and the Chair was taken in a very stimulating way by Ralph's cousin, Charles J. Chislett, Esq., of Rotherham.

Dr. Moore took as his subject "Farmland, Pesticides and Birds". He first outlined the history of land use in Britain. After the clearing of the native woodland, the bird population in medieval England was probably poor. Then when smaller fields were in use and hedges planted, the result was recolonisation by the original woodland fauna. Now, with modern farming methods, larger fields, fewer hedges and reclamation of waste land, there was a reversion to earlier conditions with fewer refuges for woodland birds.

Herbicides, fungicides and insecticides now used for safeguarding crops and farmland presented an additional threat. The problem was to protect crops from pests without danger to the wildlife which it was important to conserve. The first alarm was in 1952–53 when there were many bird casualties due to non-persistent but highly toxic chemicals. More recently there had been alarming declines in raptorial species which could be traced back to the use of persistent chemicals such as aldrin and dieldrin in seed dressings in the late 1950's to 1961. Residues of these and similar poisons were being found in the eggs of sea birds and in carnivorous species such as birds of prey, foxes, stoats and pike. These insoluble compounds must be attached to organic particles in the water and they are therefore of danger to freshwater and marine life as well as land animals.

Inter-disciplinary research on both the medical and wildlife sides was now in progress, said Dr. Moore. Pesticides were very carefully controlled by a safety precautions scheme and research was being done on all new products by a team of scientists. He considered that more intensive studies were being made in Britain than in any country in the world. There was still need for far more legislation, but with flexibility, and chemicals could be used in conjunction with biological control. Dr. Moore said that the worst aspect was the destruction of habitats for wildlife; nevertheless, there was more wildlife on farms here than in other countries.

The many questions asked by members showed their great concern for wildlife and their interest in the subject which Dr. Moore had explained in such an interesting way. Mrs. E. Hazelwood moved a vote of thanks to Dr. Moore and thanked the Rotherham Naturalists for their hospitality.

SLUGS NEW TO LEEDS

JOHN ARMITAGE AND ADRIAN NORRIS

The Large Black Slug (*Arion ater*) is a familiar object in Yorkshire, both on cultivated and wild places and at times it is the only land mollusc on high ground. A subspecies with internal anatomy differing from that of the typical form is the Large Red Slug (*Arion a. rufus*), first recognised in Britain in 1940. It shows a preference for cultivated tracts and gardens and so far as is known its present distribution is mainly southerly. On 19th November, 1966, samples of a reddish-brown slug with orange foot-fringe were collected at Meanwood, Leeds, and were identified by A. E. Ellis as *A. a. rufus*, a new record for the district.

First noted as British in 1930, the Slender Slug (*Limax gracilis*) made rapid progress here and was given different generic and specific names. It is now known as the Budapest Slug (*Milax budapestensis*). It is a notorious pest among roots and tubers, is equally happy under stones on waste land and is plentiful even in the centre of Leeds.

Caruana's Slug (*Agriolimax caruanae*), also known as the Maltese Slug, was first recognised in Cornwall during 1930 and in the past fifteen years it has shown up in several parts of England, Scotland and Wales. One of us spotted the first Yorkshire colony at Boston Spa in 1957, and after a lapse of nine years we have found it established at Knaresborough; Bridlington; Farnley Hall, Leeds; and among litter below Hanover Square, Leeds.

1966 with its persistently wet spells proved ideal for slugs; and greatly encouraged by numerous finds in scattered parts of the county, many lunch-periods in the centre of Leeds were devoted to stone-turning and grubbing about in waste places, with startling results. The tough little Garden Slug (*Arion hortensis*) is plentiful in the grimy churchyard of St. John's off Briggate; and in contrast, good soil in a neglected corner of Park Square is infested with the pestiferous Netted or Mottled Slug (*Agriolimax reticulatus*).

Single examples of the Large Yellow Slug (*Limax flavus*) were found under old timber and rotting cardboard cartons near Hanover Square and Wellington Lane, and a third site yielded an infestation of remarkable proportions. Behind a hoarding in Wellington Street, in a limited area littered with sodden rubbish, timber and metal, we found adult and juvenile *L. flavus* together with batches of eggs resembling lemons in miniature. In one spot, no fewer than 22 adults had congregated under a rusting drip-tray from a gas oven.

10th November proved outstanding. While combing a large rectangular piece of waste ground margined on one side by Marlborough Street, littered with paving and kerb-stones, bricks, lumps of cement and an assortment of vegetable debris, an extensive colony of unfamiliar slugs was found. They were much like *A. ater* but slightly smaller, yet obviously mature as some were pairing and egg-laying. The adults were variable in colour with greyish and greenish forms predominating, while most of the young were buff to pale brown, strongly marked with a dark lateral band on each side, forming a lyre-shape on the mantle. Mr. Ellis, to whom we are greatly indebted for identifications, confirmations and expert dissections, promptly recognised this Leeds consignment as the Lusitanian Slug (*Arion lusitanicus*) which is new to Yorkshire and a valuable link with the first and second English records, from Durham (1952) and Nuneaton, Warwick (1958).

This fine species may be indigenous to Ireland, Dr. W. E. Collinge having discovered a colony at Bantry Bay in 1893 when he published his discovery and described four colour-forms, three of which are present in Leeds. Oddly enough, a succession of distinguished malacologists who published works on the British slugs including Yorkshire's own John W. Taylor (1902–07) and W. Denison Roebuck (1921), and more recently Dr. H. E. Quick (1949) and A. E. Ellis (1951) all overlooked the Irish record. The Durham and Warwick colonies have since been supplemented with further records from Devon and Cornwall. So far, little is known of its habits in a wild state, but we are aware that the globular eggs possess a calcareous covering, unlike the gelatinous eggs of *A. ater*. Abroad it has been located in Portugal, France and Switzerland.

THE YORKSHIRE NATURALISTS' UNION ONE HUNDRED AND FIFTH ANNUAL REPORT

The Hundred and Fourth Annual Meeting was held on 4th December, 1965, at Keighley by invitation of the Keighley Naturalists' Society.

The Presidential Address entitled 'Flora Europaea' was delivered by Dr. S. M. Walters, and a summary was subsequently published in *The Naturalist* 52, 1966.

The Presidency for 1967 has been offered to and accepted by Professor G. C. Varley, M.A., Hope Professor of Zoology (Entomology), University of Oxford.

The Excursions for 1967 will be to:

V.C. 61	Huggate for Millington	10th	June
V.C. 62	Great Ayton for Kildale	17th	June
V.C. 63	Broadhead Clough, Mytholmroyd	23rd	July
V.C. 64	Horton-in-Ribblesdale	27th–29th	May
V.C. 65	Ovington, for Brignall Banks	8th–9th	July

The year 1966 has again been one of steady progress. Lord Middleton was pleased to accept the Union's invitation to become its Patron in succession to the late Princess Royal.

Early in the year it was learnt with pleasure that the National Coal Board were not to proceed with its proposals to prospect for coal on the site of Stocksmoor Nature Reserve. The Union has given its support to organisations protesting against proposed limestone workings in the Dales National Park and a proposed property development in the Staithes area of the North Riding National Park, both of which were refused by the appropriate Planning Boards; also to the Hardcastle Crags Preservation Society who were opposing the Calderdale Water Board who had suggested the building of a reservoir there.

Recently a letter on the Recreational Use of Reservoirs listing waters which the Union felt should be preserved for wild life had been sent out to water undertakings and other interested organisations. The Nature Conservancy and the Yorkshire Naturalists' Trust were among those who had sent encouraging replies promising support.

The Travelling Exhibition has been completed and during the year has been circulating amongst Yorkshire Museums. The first number of a Newsletter has been sent out to all members of the Union and a second number is in preparation.

The second Chislett Memorial Lecture was given in Rotherham on 8th October, when Dr. N. W. Moore, an authority on the subject of toxic chemicals, spoke on "Farmland, Pesticides and Birds".

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 14 Life Members, 544 Ordinary Members, 54 Associates and 41 Societies. In view of the issue of a revised List of Members it appears unnecessary to duplicate the information which this contains by inserting the customary list of new members and changes of address in this Report.

Deaths

We record with regret the death of the following members: D. B. Byles, L. Carr, R. M. Garnett, Mrs. O. Pennock, and T. N. Scaling.

Resignations

Miss R. Ackroyd, Miss P. Bryan, Mrs. H. M. Calvert, Mrs. B. Cole, W. A. Crockford, P. R. Evans, T. Grant, R. D. Hind, R. Knapton, J. S. Mighell, R. Milnes, S. Molyneux, V. Rich, J. M. Smith, Hon. M. Willoughby, Leeds Co-operative Naturalists' Field Club.

New Affiliated Society

Huddersfield Birdwatchers' Club. (Hon. Sec: B. Cocking, 14 Birchington Avenue, Birchencliffe, Huddersfield.)

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

T. M. Clegg: In view of the early appearance of this report after the close of the year to which it refers, including all the records received for any particular year has always been difficult. As acting secretary of the Section, in the absence abroad of J. R. Govett, I have thus found myself confronted with a large amount of material which should have been included in the last report, as well as a large volume of 1966 records. The increase in records of non-avian vertebrates in recent years has been most gratifying and if in the course of compiling this report I have neglected to mention any person's contribution I apologise in advance; all records are needed and even if as individual items they are not included here, as part of the general picture they are important. A summary of the county's vertebrate fauna is required to compare with Clarke and Roebuck's work of the eighties and this long overdue project comes nearer to realisation with every well documented record received.

National surveys of mammals, reptiles, amphibians and fishes are in progress and these are supported by us. The better our picture of Yorkshire becomes the more we can help our national societies. I would emphasise the importance of the amphibian census; please write down all encounters with animals of this group.

Following the successful meeting at Doncaster in 1965 a further meeting took place in Rotherham during the afternoon of 8th October 1966. Mr. J. S. Griffith organised this and his local society acted as hosts; the result was an excellent gathering of members and exhibits in a veritable non-avian vertebrate 'trade fair'. Exhibits were provided by John Armitage of Leeds, Vic Mendham of Ackworth, Doncaster Museum and Mrs. E. Hazelwood, and ranged from owl pellet contents, skins — round and flat, pictures, and live mammals and amphibians of a variety of species. Mrs. Hazelwood gave a thought-provoking talk on research projects suitable for all amounts of 'spare time'. It is hoped that further meetings of this nature will be held in 1967.

MAMMALIA

Insectivora

Hedgehog: Most of those reported were victims of road accidents and A. J. Wallis, recording such mortality in the Scarborough–Malton–York area, produced the following figures for 1965:

MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.
1	6	2	3	0	4	2	2	2

The species was reported from the Allerston Forest area in 1965. (G. Simpson).

Mole: High numbers were reported in parts of the Barnsley area at Cawthorne, Pogmoor and Silkstone (C. Bower). In the low-lying marshes around Doncaster winter activity is confined to raised paths and road banks. On the Y.N.U. excursion to Goole Moors in June 1966 the species was recorded as a colonist of raised paths, made up of rich imported soil on otherwise uninhabited peat.

Common Shrew: Reported from numerous localities, usually found to be common in lowland areas. A female, trapped at Cloughton near Scarborough on 20th September 1965 contained nine full-term embryos (R. S. Pollard). A female received at Doncaster Museum in mid-October 1966 was also probably breeding in its first autumn. Its nape had extensive white hair where the winter pelage had grown over a mating scar.

Pygmy Shrew: Records from Huddersfield, Ackworth, Brockadale, Doncaster, Scarborough, Spurn, the York area and Burley-in-Wharfedale. Two were found dead on the grassy slopes of Filey Brig in 1965 (F. Thompson).

Water Shrew: Widely distributed in the Wintersett area (J. S. Armitage), numerous records from the Went Valley at Brockadale (V. Mendham), one found dead at Old Denaby near Doncaster in April 1966 (C. J. Devlin), and seen at Kirkburton sewage farm in March 1966 (M. Benton). At Spurn one found dead 9th July 1966 (C.J.D. from Spurn log).

Chiroptera

Natterer's Bat: A single specimen was handled and photographed at Burley-in-Wharfedale in the summer of 1966.

Daubenton's Bat: A specimen from Helmsley was taken to York Museum in October 1965 (C. Sims).

Noctule: One found dead at East Ayton in August 1966 (E. W. Aubrook). At Hatfield near Doncaster up to six large bats seen regularly in August 1965 were considered to be of this species (T.M.C.).

Pipistrelle: Records from urban Doncaster, Scarborough and Ackworth.

Long-eared Bat: Colonies of up to 50 reported in Scarborough area (A.J.W. and C. I. Massey).

Bat species: The usual yearly pattern of records was shown at Spurn with a maximum of two seen on three days in late May, one day in July, early and late August and September 1st–6th and 21st–27th. These may be migrants; mist-netting ornithologists could help in identifying them.

LAGOMORPHA

Rabbit: Casual, not common, in Horsforth area of Leeds (P. Baldwin), increase in Carlton-Wintersett area (J.S.A.), good numbers in Silkstone area (C.B.), frequent in Wilton Park, Batley (T.M.C.) run some estimates of local status. Myxomatosis still present however, Wilton near Pickering in March 1965, Doncaster in summer of 1965, Armthorpe in early 1966, Dringhouses near York in October 1966. Amongst population of Allerston Forest some melanic individuals seen (G.S.).

Brown Hare: Widely recorded in lowland areas; estimates of status and records from shooting bags desirable in 1967. Female suckling two leverets on Oliver's Mount, Scarborough, in September 1965 (A.J.W.).

Mountain Hare: Seen in usual area along Yorkshire-Derbyshire border in 1965 (C. Jukes). Recovery from severe weather of 1963 does not seem complete yet.

RODENTIA

Red Squirrel: Recorded from Bretton Park (C.J. *et al.*), Huddersfield area (C. Disbrey, E.W.A.), Ripley (E. Thompson), Wentworth Woodhouse (specimen to Doncaster Museum), probably escapes seen near York (C.S.). From recent records it would seem that the Huddersfield–Barnsley area holds the greatest stock of this species.

Grey Squirrel: Increasing at Horsforth, Leeds (P.B.), not common in Allerston Forest (G.S.), very common in spite of massive attempts at control at Sandbeck and Roche Abbey. More summaries of local status required. In York area records from Askham Bog, Skipwith Common, Sutton Wood and Nunburnholme (C.S.). Recorded at Gouthwaite in December 1965 (Miss J. Robinson).

Chipmunk: Records of escapes, presumably *Eutamias* sp., from near Leeds (J. Armitage) and Forge Valley near Scarborough on 26th June, 1966 (E.H. and C. H. Wear). Two escaped Asiatic striped squirrels, the popular pet, did not survive long in the wild at Scarborough (C.I.M.).

Bank Vole: Records from Allerthorpe Common, Doncaster, Cloughton, Scarborough, Bretton, Ackworth and Brockadale. As with most small mammal species the distribution shown is largely that of observers who run trap-lines (or keep cats).

Short-tailed Vole: Widespread in York, including Museum grounds, and around Doncaster. At Thorpe Marsh, near Doncaster, peak population of winter 1964–5 crashed in two weeks from 20th March, 1965, land was very 'vole sick' in 1965–6. A few trapped, but many recovered from Barn Owl pellets at Ackworth shows frequent pattern; cats and owls catch this species much better than traps often do. Cats and Kestrel hunted land being built upon at Hatfield during summer and autumn 1966, with great success.

Water Vole: Records from Blackmoorfoot (Mr. Norcliffe), Kirkburton Sewage Farm (M. Benton), eastern suburbs of York, Askham Bog, Skipwith Common (C.S.), Wintersett (J.S.A.), Doncaster area — common on all watersides (T.M.C.).

Long-tailed Field Mouse: Reported generally, again all trappers had records. Observations on preferred habitats would be useful.

House Mouse: Only found where actively sought, usually as household pests. Few recovered from Barn Owl pellets, Ackworth.

Brown Rat: Appears to be increasing as a late summer road casualty.

Black Rat: Only records of animals destroyed in Hull waterfront and ships.

CETACEA

Porpoise: Frequent records from Spurn, Filey and Scarborough, wherever sea-watching ornithologists gather.

White-beaked Dolphin: Eight were seen about twelve miles off Scarborough on 18th September, 1966, during the course of a marine bird-watching excursion organised by A.J.W.

Lesser Rorqual: A Whale apparently of this species was seen nine miles off Scarborough on 18th September, 1966.

CARNIVORA

Fox: Records from Scarborough (killed by taxi in centre of town), Huddersfield, Wintersett, Melton Woods and Old Denaby near Doncaster. In recent years Upper Wharfedale Fox Club have accounted for about 150 per year.

Stoat: Widespread in a variety of habitats from suburban Leeds and urban Doncaster to Bempton Cliffs and Scarborough Castle Hill. Records in urban areas appear to be more numerous.

Weasel: Again more suburban records — Huddersfield, Leeds, Doncaster, Barnsley, Hull and Beverley. J. S. Armitage mentions this species as frequent in the Carlton–Royston area and comments on the absence of Stoats. Comparative figures from gamekeeper's gibbet at Sandbeck Park in March 1965, gave 71 Weasels to 24 Stoats.

American Mink: Records of this unwelcome colonist mainly concern animals destroyed at Dunsop Bridge, Slaidburn, Arthington, Brighouse, Mytholmroyd (Oct. 1965, I. Morley), Ladybower section of Yorkshire — Derbyshire border, Doncaster, and in the north-west from Winterburn, Eshton, and Hawkswick in Littondale (Susan D. Brooke).

Badger: The first breeding record for the Halifax parish was blighted by the shooting of an adult and two cubs (I.M.). A sett in Brockadale was reactivated after a poisoning attempt (V.M.). Two setts active in Melton Wood near Doncaster (J. B. Hague) and observations from New Mill and High Hoyland near Huddersfield (C.D.). Road accident victims were reported from Wakefield, Hickleton and Sheffield. The corpus of information on the distribution continues to grow very well but all setts should be mapped and recorded firmly.

Common Seal: Spurn, max. two on 17th May and 3rd September.

Grey Seal: Frequent at Spurn, max. six on 12th September. One spent the winter of 1965–6 in and around Scarborough Harbour.

ARTIODACTYLA

Fallow Deer: Seen on golf course on outskirts of Mirfield (E. Thompson) and also in the vicinity of Studley Park (E. Kemp).

Red Deer: The only record relates to presumably feral animals in the vicinity of Studley Park (E.K.).

Roe Deer: Evidence of previously unsuspected high numbers in the forestry land at Dalby and Allerston is provided by Mr. G. Simpson in his 1964–5 report. From this I quote, "A preliminary census on Dalby Beat revealed a population of about 70 Roe Deer and from my summer observations I have no doubt that there are over 100 in Allerston Forest and neighbouring woods".

REPTILIA

Slow Worm: Only casual records from the Scarborough area, relating mainly to the banks of Scalby Beck.

Common Lizard: Records from Suffield Moor, 31st March, 1965 (G.S.), Brockadale, Spurn, Rossington Bridge, near Doncaster, Askham Bog, Strensall Common, Skipwith Common and Allerthorpe Common.

Grass Snake: A summary of 1965 and 1966 records for the Doncaster area gives reports from the following localities:— North Bridge, Balby, Potteric Carr, Bessacarr, Bentley, Thorpe Marsh, Sandall Beat Wood, Denaby Ings and Sprotborough. It will be seen from this list that the species is still widespread in the area but the number killed first and examined later is quite alarming. At Spurn in October 1966, one was seen on a number of days at the end of the month (C.J.D. from Spurn log).

Adder: Only reported from the forestry area of North-East Yorkshire apart from welcome records for Thorne Moors — confirmed by a case of 'snake bite'. In this area Mr. A. Wright has seen several and on the Y.N.U. excursion on Goole Moors skin casts were found.

AMPHIBIA

Crested Newt: 1965 records from a number of places round York (C.S.) and Doncaster (T.M.C.).

Smooth Newt: Widespread — no evidence given of local decline by observers.

Palmate Newt: Apart from casual mentions for Huddersfield and Halifax, no recent written reports have been received.

Common Toad: Widespread but very few written records mention this species. Records of local status would be welcome for 1967.

Common Frog: Widespread but an increasing number of reports of local decline continue to come in. An intensive search in 1967 may indicate some pattern in the areas for which the decline is most marked.

FISHES

A large volume of records collected by Mr. A. Rennie of the Yorkshire Ouse and Hull River Authority was received in late 1965 by J.R.G. My own records for South Yorkshire have also now been summarised and again amount to a considerable body of material. In addition, fish records have also been received from some other observers who have also supported the British Ichthyological Society's survey. In the next year it may be possible to compile an authoritative fish-list for much of Yorkshire and thus only a digest of the more outstanding records or those which refer to species on which more information is required is given here.

Brook Lamprey: Dibble Bridge, near Castleton, April 1961 (Y.O.R.B.); Goldsborough Bridge, River Nidd, January 1954 (Y.O.R.B.).

Rainbow Trout: Lower Lake at Kilnwick Percy 1964; lake at Hymers College, Hull 1965; River Wharfe at Harewood 1959.

Rudd: River Foss, Yearsley Bridge 1952 (Y.O.R.B.); Willowgarth Pond, Arksey near Doncaster 1965 (T.M.C.) and ponds near Hatfield 1965 (T.M.C.).

Bleak: River Ouse, Widdington 1962 (Y.O.R.B.); River Swale, Topcliffe 1962; Dennison Road Pond, Selby 1951; Milby Cut, Boroughbridge 1962 — all Y.O.R.B. records.

Ten-spined Stickleback: River Calder, Wakefield 1958 (Y.O.R.B.) — this appears to be the most westerly record for the county so far. Broomhill Flash and River Dearne cut-off at Denaby 1966 (T.M.C. and C.J.D.); common at Potteric Carr; round Hatfield and Thorne (T.M.C.); River Went, near Ackworth (V.M.); Askham Bog (Y.N.T. report).

Ruffe: Since this species is not common in many apparently suitable places, records will be welcomed. The following are recent localities — River Ouse, Nun Monckton, Widdington; River Swale, Topcliffe, Morton; River Ure, Boroughbridge; River Nidd, Cowthorpe, Kirk Hammerton and River Derwent at a number of points.

Burbot: In view of the national enquiry into the status of this species all records, of any age, are important. Present in New Idle River Drain in period 1930–8 (M. Hanson of Doncaster). Frank Thompson of York in correspondence with F. C. Barton of the *Yorkshire Evening Post* clarified the position on the Derwent a little — records include Thorganby, Elvington and much higher upstream near Malton (early 1960's ?).

Opah: One, weighing 8 stones caught in North Sea, displayed in a Hull fish shop, July 1966 (*Hull Mail* per J.R.G.).

Sun-fish: One was caught off Flamborough in late August (*Yorkshire Evening Post* per J. Cudworth) and another at Filey in October (Doncaster Museum) and there were a few less definite reports in the early autumn of 1966.

Lesser Forkbeard: Landed at Whitby from local keel-boat, September 1965 (*Scarborough Evening News* per A.J.W.).

CONTRIBUTORS

(with apologies for omissions)

S. Anscombe
J. Armitage
J. S. Armitage
E. W. Aubrook
P. Baldwin
F. C. Barton
M. Benton
C. Bower
Miss S. Brooke
L. Carr
P. Clark
T. M. Clegg
J. Cudworth
C. J. Devlin
C. Disbrey
Mrs. A. Dix
H. B. Elenor
J. B. Hague
H. T. James
C. Jukes
E. Kemp
Mrs. Leitch
D. Marlborough
C. I. Massey
V. Mendham
I. Morley
Mr. Norcliffe
R. S. Pollard
A. Rennie
Miss C. M. Rob
Miss J. Robinson
C. Sims
G. Simpson
B. R. Spence
E. Thompson
F. Thompson
A. J. Wallis
C. H. Wear
E. H. Wear
A. Wright

ORNITHOLOGY

Interim Report (R. F. Dickens): The customary meetings in conjunction with the Fishes, Amphibians, Reptiles and Mammals Section were held in Leeds on the third Saturdays of March and October. On both dates the General Committee of the section and the Protection of Birds Act Committee held meetings earlier in the day, their deliberations being reported to the full sectional meeting.

Though not meeting formally, the Reports Committee has been actively engaged in the circulation and discussion of records; and in preparing, on behalf of the Union, a case for preserving some of the more important reservoirs from recreational inroads.

Unfortunately indisposition of the acting editor has delayed the appearance of the annual ornithological report and we must apologise that by the time it is in members' hands the 1965 events it records will already be at least twelve months old. A. J. Wallis will be editing the report for 1966, a year during which Petchora Pipit was caught and ringed at Spurn — a first for the British mainland — and Penduline Tit was seen, believed to be the first for the British Isles.

Spurn Bird Observatory has again had a most successful year, during the course of which its second separate annual report has been printed. A new Heligoland trap has been completed and improvements to accommodation carried out.

The 1966 International Congress brought many overseas visitors to Britain and a number of them to such places as Bempton and Fairburn which figured in the guide published for the occasion by the R.S.P.B.

In September, a North Sea trip was organised and results were sufficiently encouraging for similar plans to be contemplated for 1967.

Members with outstanding records for 1966 are asked to forward them without delay to the vice-county recorders as listed on members' cards.

CONCHOLOGY

(E. Dearing): There was considerable modification of the programme for 1966 as the season progressed. Illness of many members caused cancellation of the February meeting, flooding led to the abandonment of the Stamford Bridge excursion in April, whilst holidays and sickness so reduced numbers in May that the two survivors joined the Lancashire conchologists in a study of the canal at Manchester.

In January Mrs. Macmillan spoke on "Planorbis, with special reference to the species *P. planorbis* and *P. carinatus*"; Mr. Armitage dealt comprehensively with "*Pomatias elegans* and its associates" in November; whilst Mr. Norris, in the course of his paper in March on "The Mollusca of Hull", mentioned a surprising number of species which are thriving in a completely urban area. Due to secretarial confusion there were two excursions to Blubberhouses, one on Sept. 3rd. and the other a week later. The meeting at Thorne in October was the highlight of the years' activities when Mrs. Morehouse kindly entertained members to tea afterwards. There were members of the section present on three of the Y.N.U. excursions.

ENTOMOLOGY

Coleoptera (E. W. Aubrook): The attention which the county has received from visiting coleopterists, as well as resident collectors, has resulted in a list of additions to the records which is the most extensive for many years. Of the 21 species new to the county, two are additions to the British list, and of these one is a unique specimen. Dr. A. M. Easton's work on *Meligethes* during several visits to Yorkshire has helped to build up the total of 69 species new to one vice-county or another.

A particularly interesting record is that of *Thryogenes scirrhosus* Gyll., taken by Mr. P. W. H. Flint at Hessle, and last recorded for Yorkshire (without precise locality) in Stephens' *Manual of British Coleoptera* (1839).

The following collectors, in addition to the writer, are indicated by initials: M. D. Barnes, C. Devlin, A. M. Easton, J. H. Flint, P. W. H. Flint, F. Hawkins, C. Johnson, P. Skidmore.

Trechus secalis Payk. (64) Studley, 6/7/66; E.W.A.
Feronia angustata Dufts. (63) Sandall Beat Wood, Doncaster, 30/5/66; C.D.
†*Agonum livens* Gyll. (63) Denaby Ings, 8/3/66; P.S.
Hygrotus versicolor Schall. (63) Haw Park Canal, 25/9/65; F.H.
**Hydroporus neglectus* Schaum. (63) Goole Moors, 12/6/66; E.W.A.
**Ochthebius bicolon* Germ. (64) Studley, R. Skell, 6/7/66; E.W.A.
Hydraena nigrita Germ. (64) Studley, R. Skell, 6/7/66; E.W.A.
†*Helophorus strigifrons* Thoms. (64) Askham Bog, regularly in litter '65 and '66; E.W.A.
†**H. walkeri* Sharp. (62†) Ayton Castle, 22/5/64; E.W.A.: (61*) Bridlington, 18/4/65; E.W.A.
**Choleva agilis* Ill. (63) Haigh Bridge, Bretton, in flood refuse, 18/12/65; F.H.
**C. glauca* Britt. (61) Riccall, 3/9/66; J.H.F.
**Colenis immunda* Stm. (64) Studley, 6/7/66; E.W.A.
**Clambus pubescens* Redt. (64) Gisburn, 7/6/66; C.J.
†*C. nigriclavis* Steph. (64) Studley, 6/7/66; C.J.
†*C. nigrellus* Reitt. (64) Studley, 6/7/66; C.J.
†*Neuraphes helvolus* Schaum. (62) Brompton, swept by R. Derwent, 3/8/62; E.W.A.
**Acrotrichis grandicollis* Mann. (63) Farnley Tyas, 7/5/66; E.W.A.
**A. thoracica* Waltl. (62*) E. Ayton, 28/8/66; E.W.A.: (64*) Gisburn, 7/6/66; C.J.
**A. atomaria* Deg. (61*) Gilberdyke, 20/5/66; E.W.A.: (64*) Studley, 6/7/66; C.J.
**A. intermedia* Gill. (63) Smith Wood, Farnley Tyas, 6/2/66; E.W.A.
**A. sericans* Heer. (62) Brompton, 3/8/62; E.W.A.: (63*) Warp Farm, Thorne, 12/6/66; E.W.A.: (64*) Gisburn, 7/6/66; C.J.: Studley, 6/7/66; E.W. A.
**A. fascicularis* Hbst. (64) Studley, 6/7/66; E.W.A., C.J.
**A. fratercula* Matt. (64) Studley, 6/7/66; C.J.
†*A. norvegica* A. Strand. (64) Studley, 6/7/66; C.J.
†*A. insularis* Makl. (63) Roche Abbey, 27/10/65; C.J.: Farnley Moor, 25/4/66; E.W.A. The first British specimens.
**Nephanes titan* Newm. (64) Gisburn, 7/6/66; C.J.
**Phyllodrepa ioptera* Steph. (64) Askham Bog, 21/9/66; E.W.A.
Omalium oxyacanthae Grav. (64) Studley, 6/7/66; E.W.A.
Coryphium angusticolle Steph. (63) Smith Wood, Farnley Tyas, 6/2/66; E.W.A.
**Carpelimus rivularis* Mots. (62) Yedingham, 7/6/60; E.W.A.
†*C. impressus* Bois & Lac. (62) Topcliffe, 15/6/60; E.W.A.
**C. corticinus* Grav. (63) Denaby Ings, 15/3/66; E.W.A.
**C. pusillus* Grav. (63*) Roche Abbey, 27/10/65; E.W.A.: (64*) Gisburn, 7/6/66; C.J.
†*C. gracilis* Mann. (63) Cawthorne, 8/5/48; E.W.A.: Morley, 3/5/65; E.W.A.
C. subtilicornis Roub. (64) Nun Monkton, river bank, 16/5/62; E.W.A.
Stenus guynemeri du Val. (63) Slackcote, Denshaw, c. 1964; P.S.
S. cautus Er. (63) Denaby Ings, 15/3/66; E.W.A.
**S. carbonarius* Gyll. (61) Wressle, 26/2/66; P.W.H.F.: (63*) Denaby Ings, 15/3/66; E.W.A.
**S. crassus* Steph. (63*) Farnley Tyas, 7/5/66; E.W.A.: (64) Gisburn, 7/6/66; C.J.
†*S. formicetorum* Mann. (62) Ayton Castle, 22/5/64; E.W.A.
†*S. brevipennis* Thoms. (64) Penyghent, 7/6/66; C.J.
**S. palustris* Er. (64) Askham Bog, 8/12/45, 3/5/65; E.W.A.
**Euaesthetus ruficapillus* Bois. & Lac. (63) West Bretton, 11/8/48; E.W.A.
**E. laeviusculus* Mann. (63) Stocksmoor Reserve, 22/5/65; E.W.A.

†**Lithocharis nigriceps* Fr. (63†) Thurstonland, 3/5/64; E.W.A., Stocksmoor Reserve, 22/5/65; E.W.A.: (64*) Gisburn, 7/6/66; C.J.

Lathrobium quadratum Payk. (62) Snainton Mere, 7/6/60; E.W.A.: (63) Denaby Ings, 15/3/66; E.W.A.

**L. filiforme* Gr. (63) Denaby Ings, 15/3/66; E.W.A.: (64*) Askham Bog, 3/4/65; E.W.A.

Conosomus immaculatus Sturm. (62) Newton Dale, 20/8/66; E.W.A.

**C. lividus* Er. (63) Stocksmoor Reserve, 20/12/65; E.W.A.

Mycetoporus brunneus Marsh. (64) Penyghent, 7/6/66; C.J.

**Tachyporus scutellaris* Rye. (64) Askham Bog, 8/12/45; E.W.A.

**Atheta sodalis* Er. (63) Toby Wood, Denby Dale, with *Formica lugubris*, 29/4/66; E.W.A.

Zyras humeralis Gr. (63) Toby Wood, Denby Dale, with *Formica lugubris*, 29/4/66; E.W.A.

**Ocyusa incrassata* Muls. & Rey. (63) Smith Wood, Farnley Tyas, 6/2/66; E.W.A.

Biblophorus bicolor Denny. (62) Newton Dale, 20/8/66; E.W.A.

Bryaxis curtisii Leach (64) Studley, 6/7/66; C.J.

Gnathoncus [*rotundatus* Kug.] v. *nannetensis* Mars. (62) E. Ayton, in numbers in poultry house, 28/8/66; E.W.A.

Carcinops 14-*striata* Seph. (62) E. Ayton, with the above.

Thanasimus formicarius L. (63) Cantley, 28/4/66; C.D.

Hylocoetus dermestoides L. (62) Dalby Forest, 14/9/65; Black Park, 17/9/65; G. Simpson.

**Hypnoidus dermestoides* Hbst. (63) Langsett, 6/7/40; M.D.B.

Buprestis rusticorum Kirby. (63) One emerged from constructional timber in new house, Doncaster, July, 1966. Not recorded previously from Britain.

**Cyphon phragmiteticola* Nyh. (63) Denaby Ings, 15/3/66; E.W.A.

†*Byrrhus arietinus* Steff. (64) Skipton, 1/7/34; M.D.B. Recently added to British list.

**Meligethes brevis* Sturm. (61) Ganton Wold, 10/8/48; A.M.E.

M. subrugosus Gyll. (61) Bishop Wold, 6/10/65; A.M.E. Second Yorks. record.

**M. difficilis* Heer. (61*) Bridlington, 7/8/48; Thorpe Basset, 7/10/65: (63*) Rigton, 25/6/49: (64*) Boroughbridge, 23/6/49: (65*) Boroughbridge, 24/6/49; A.M.E.

†**M. morosus* Er. (61†) Bridlington, 7/8/48: (62*) Oswaldkirk, 26/6/49: (63*) Rigton, 25/6/49: (64*) Boroughbridge, 23/6/49: (65*) Carlton Miniott, 24/6/49; A.M.E.

**M. brunnicornis* Sturm. (63*) Rigton, 25/6/49: (65*) Boroughbridge, 26/4/49; A.M.E.

**M. viduatus* Heer. (63) Ecclesfield, 3/9/64; A.M.E.

†**M. pedicularius* Gyll. (62*) Gundale, 19/7/65; E.W.A.: (63†) Rigton, 25/6/49; A.M.E.

**M. nigrescens* Steph. (64*) Boroughbridge, 23/6/49; Lindley, 25/6/49: (65*) Boroughbridge, 24/6/49; A.M.E.

**M. obscurus* Er. (63*) Rigton, 25/6/49: (64*) Lindley, 25/6/49: (65*) Kirby Knowle, 24/6/49; A.M.E.

**M. erythropus* Marsh. (62) Gundale, 19/7/65; E.W.A. (65*) Kirby Knowle, 24/6/49; A.M.E.

†*M. gagatinus* Er. (62) Forge Valley, 11/8/48; A.M.E.

**Cyrtotriplax bipustulata* F. (63) Cantley, 28/4/66; P.S.

**Paramecosoma melancocephalum* Hbst. (63*) Haigh Bridge, Bretton, 18/12/65; F.H.: (64) Ilkley, 21/2/66; E.W.A.: Studley, 6/7/66; C.J.

Caenoscelis subdeplanata Bris. (63) W. Bretton, 7/7/65; C.J. First British specimen.

Atomaria lewisi Reitt. (64) Gisburn, 7/6/66; C.J.

†*Lathridius bifasciatus* Reitt. (63) Doncaster, 4/4/66; P.S.

Anommatus 12-*striatus* Mull. (63) Low Farm, Armthorpe, 6/8/66; P.S.

†*Harmonia* 4-*punctata* Pont. (64) Bishop Wood, 1/6/66; P.W.H.F.

**Cis vestitus* Mell. (63) Kirklees, 20/7/48; E.W.A. Second Yorks. record.

**Dryophilus pusillus* Gyll. (63) Sandbeck, 9/6/66; E.F.G.: Low Farm, Armthorpe, 6/8/66; P.S.

**Salpingus reyi* Ab. (64) Askham Bog, 8/8/65; E.W.A.

†*Hypophloeus unicolor* Pill. & Mitt. (63) Bawtry Forest, 12/4/66; P.S.: Sandall Beat Wood, 6/66; P.S.: Goole Moors, 12/6/66; C.D.: Low Farm, Armthorpe, 6/8/66; P.S.

**Aphodius tessulatus* Payk. (61) Riccall, 3/9/66; J.H.F. Only previous Yorks. records from Huddersfield district.

Strangalia 4-*fasciata* L. (63) Goole Moors, 26/6/66, pupa in birch log; E.W.A.

**Donacia clavipes* F. (64) Askham Bog, 7/66; F.H.
**Bruchus fasciatus* Ol. (61) Cowlam, 30/7/66; J.H.F.
**Platyrrhinus resinosus* Scop. (63) Sandall Beat Wood, 30/5/66; C.D. Second Yorks. record.
Omias mollinus Boh. (62) E. Ayton, 20/6/66; E.W.A.
†*Thryogenes scirrhosus* Gyll. (61) Hessle, 9/6/66; P.W.H.F.
Pissodes castaneus Deg. (62) Nr. Sand Hutton, 19/8/66; E.W.A.
**Ceuthorrhynchus rugulosus* Hbset. (63) Walton Hall, 24/6/64; E.W.A.
†*Rhinoncus bruchoides* Hbst. (61) Bridlington, 6/6/60; E.W.A.

Hemiptera (J. H. Flint): The most interesting discovery this year is that of a strong colony of *Lygus pratensis* L. on Strensall Common where my son Jeremy first found specimens in the early summer. Search in the autumn for the new generation was amply rewarded. The older records of *L. pratensis* refer to the complex of species, now split up, of which *L. rugulipennis* Popp. is the most abundant and widespread and the only representative of the genus reliably known from Yorkshire before. *L. pratensis* is evidently of very local distribution in the County.

Mr. Aubrook had two uncommon little bugs from Askham Bog, *Ceratocombus coleoptratus* Zett. and *Fieberocapsus flaveolus* Reut. Both have only been noted twice before in Yorkshire and they are probably overlooked because they are so small and live at the roots of grass tufts and among detritus in marshy places.

Quite a number of new localities have been added to the records during the year and a list of the more notable species is given below. Records or specimens have been received from Messrs. J. Armitage, E. W. Aubrook and R. Crossley.

HETEROPTERA

**Nysius ericae* Schill. (61) Skipwith Common, by sweeping heather, 3/9/66; J.H.F.
Acalypta carinata Pz. (62) Forge Valley, 26/6/66; E.W.A.
**Temnostethus gracilis* Horv. (62) Forge Valley, 2/8/66; E.W.A.
Loricula elegantula Bär. (63) West Bretton, common on cut ends, 22/7/66; E.W.A.
L. pselaphiformis Curt. (63) Farnley Tyas, 3/7/66; (65) Bellarby, 4/7/64; E.W.A.
**Lopus decolor* Fall. (63) Haw Park, 22/7/65; E.W.A.
Macrotylus paykulli Fall. (61) Burdale, on *Ononis*, 30/7/66; J.H.F. It was found on the disused railway line. There is only one other inland record in Yorkshire although it is abundant on some coastal cliffs and dunes.
Campyloneura virgula H.-S. (62) Newton Dale, 20/8/66; E.W.A.
**Fieberocapsus flaveolus* Reut. (64) Askham Bog, 29/7/66; E.W.A.
Lygus pratensis L. (62) Strensall Common, 30/4/66, 28/5/66; Jeremy D. H. Flint; 2/10/66, commonly by beating birch among heather; J.H.F.
Calocoris roseomaculatus Deg. (61) Burdale, on *Centaurea nigra*; 30/7/66; J.H.F.
**Ceratocombus coleoptratus* Zett. (64) Askham Bog, 25/8/66; E.W.A.

HOMOPTERA

Batracomorphus irroratus Lewis (61) Cowlam, 30/7/66; J.H.F.
Diplocolenus bensoni China (64) Penyghent, commonly between 1,500′ and 2,000′, 25/8/66; J.H.F.
**Streptanus aemulans* Kbm. (61) Burdale, 30/7/66; J.H.F. The only other Yorkshire record is from the limestone slope at Etchell Crags, Bardsey.
Cicadula intermedia Boh. (64) Penyghent, by sweeping grassland at 1,500′ — 2,000′, 25/8/66; J.H.F.
†*Kelisia guttula* Germ. (61) Cowlam, 30/7/66; J.H.F.

Hymenoptera (J. H. Flint): Insufficient work has been done in this order to permit an assessment of the past year. Mr. M. T. Brook collected a good series of the larger sawflies at Bretton Park and most of these, and much of the material collected by myself and Mrs. Flint, remain to be identified. No real abundance of sawflies was seen except in the case of the *Tenthredo arcuata* group at Cayton Bay and elsewhere in the late summer.

Work on the aculeate wasps has produced quite a number of records of new localities. This section of the Hymenoptera has been greatly neglected in Yorkshire. Only Allerthorpe Common has been well worked in the past. There are a fair number of species recorded from the Wakefield district, a good scattering of records in the

Bradford to Keighley area and a list from Spurn. Apart from these there are odd records from various parts of the county while the greater part is completely unworked. Determinations are by me unless otherwise stated.

SYMPHYTA

**Arge gracilicornis* Klug (63) Bretton Park, 13/6/66; M. T. Brook (det. Mrs. H. E. Flint).

Dolerus yukonensis Norton (64) Lower slopes of Whernside above Ribblehead at 1,500′–2,000′, 29/5/66.

Empria immersa Klug (64) Ribblehead, 29/5/66.

**Ametastegia pallipes* Spin. (63) Broadhead Clough, Mytholmroyd, 13/6/65.

†*Monophadnoides alternipes* Klug (64) Mackershaw Wood, Ripon, 24/5/64.

**Allantus calceatus* Klug (62) Strensall Common, 29/8/66.

Rhogogaster punctulatus Klug (63) Bretton Park, 13/6/66; M. T. Brook (det. Mrs. H. E. Flint).

Tenthredo colon Klug (62) Gundale, near Pickering, 26/6/65.

**Macrophya albicincta* Schrk. (62) Strensall Common, 28/5/66; Jeremy D. H. Flint (det. J.H.F.).

†*Nematus melanaspis* Hart. (61) Skipwith Common, bred from larva taken 3/9/66 feeding on birch.

ACULEATA

Priocnemis perturbator Harris (63) Sprotborough, 22/5/65.

†*P. obtusiventris* Schdt. (62) Cayton Bay, 8/65; Strensall Common, 31/8/65.

**Pompilus plumbeus* F. (64) Stutton, near Tadcaster, 7/47.

**Anoplius nigerrimus* Scop. (62) Strensall Common, 29/8/66.

**Symmorphus elegans* Wesm. (64) Stutton, 7/47.

Ammophila sabulosa L. (61) Skipwith Common, 3/9/66.

**Gorytes tumidus* Parry (62) Strensall Common, 29/8/66.

Trypoxylon attenuatum Smith (61) Skipwith Common, 14/9/65.

Ectemnius continuus F. (62) Strensall Common, 10/7/66, 29/8/66.

†*Crossocerus ambiguus* Dahl. (61) Skipwith Common, 14/9/65.

†*C. quadrimaculatus* F. (64) Roundhay Park, Leeds, 29/8/65.

Diptera (R. Crossley): Much useful collecting has been done during 1966 and the following list contains the more important records. It is interesting to note that even in a well worked family such as Syrphidae species hitherto unrecorded in the county are still being discovered. In the less popular families much still remains to be done and it is therefore gratifying to note that interest in this Order is steadily growing. My thanks are due to the following who have kindly submitted records: Messrs. E. W. Aubrook, H. E. Beaumont, M. T. Brook, P. Skidmore, C. J. Smith.

SYRPHIDAE

**Chrysotoxum bicinctum* L. (64) Appleton Roebuck, 16/7/66; M.T.B. (det. R.C.).

**Ferdinandea cuprea* Scop. (63) Denaby Ings, several specimens, 22/5/66; C. Devlin (det. P.S.): 1 ♂, Sandbeck, 9/6/66; P.S.: 1 ♀, Sandall Beat Wood, 1/6/66; P.S.

†*Brachyopa insensilis* Collin (63) 1 ♀, Sandbeck, 9/6/66; C. Devlin (det. P.S.). This is regarded as a rare fly, hitherto only recorded for the southern half of England (Coe, R.L. Syrphidae. *Hand. Ident. Brit. Ins.*, X, pt. 1.).

†*Xylota xanthocnema* Collin (63) 1 ♂, Sandbeck, 9/6/66; C. Devlin (det. P.S.). This again is a first record for the North of England and it is remarkable that this and the last species should both be taken on the same day in the same locality.

†*Xylota nemorum* Fab. (64) 1 ♀, Askham Bog, 14/5/66; C.J.S. (det. R.C.): (63*) Bretton Park, 13/6/66; M.T.B. (det. R.C.). This fly is little recorded in the North of England and although it is undoubtedly scarce it may have been overlooked in the past.

**Eumerus strigatus* Fall. (63) 1 ♂, Goole Moors, 12/6/66; R.C.

DOLICHOPODIDAE

Scellus notatus (Fab.) (63) Denaby Ings, 8/6/66; P.S. There is only one previous record for V.C. 63 for this species.

MUSCIDAE

**Thricops variabilis* (Fall.) (63) 2♂♂, 1 ♀, Bretton, 15/6/66; M.T.B. (det. P.S.): 1 ♂, Sandbeck, 19/6/66; 1 ♂, Cadeby, 19/6/66; P.S.
**T. longipes* (Zett.) (64) 1 ♂, Buckden, 26/6/66; C. Devlin (det. P.S.).
T. aculeipes (Zett.) (64) 1 ♂, Buckden, 26/6/66; C. Devlin (det. P.S.).
†*Hydrotaea cyrtoneurina* (Zett.) (63) 1 ♂, Cadeby, 19/6/66; P.S.
†*Mydaea anicula* (Zett.) (63) 1 ♂, Denaby Ings, 8/6/66; P.S.
†*M. ancilla* (Mg.) (63) 1 ♀, Sandall Beat Wood, 1/6/66; P.S.
**Lispe tentaculata* (Deg.) (63) 1 ♀, Thrybergh Reservoir, 22/7/66; C. Devlin (det. P.S.).

ANTHOMYIDAE

†*Eustalomyia histrio* (Zett.) (63) 2♂♂, Edlington Wood, 18/6/66; C. Devlin (det. P.S.).

HIPPOBOSCIDAE

**Ornithomya chloropus* Bergr. (63) Grains Bar, –/7/53; P.S.: Meltham, ex Meadow Pipit, 1/7/65; R.C. (det. H.E.B.).
**O. fringillina* Curt. (62) Near Ravenscar, 1 ♀ ex Dunnock, 4/9/66; H.E.B.

Lepidoptera (S. M. Jackson): I am afraid 1966 has not been a good year, even the common species being down in numbers. There have been, however, some exceptions, especially among the migrants, and the very rare *Leucania unipuncta* has been taken at Filey. Although a good number of this moth have been taken in the south the present record is the first for Yorkshire. Like 1964, it has been a particularly good year for the Red Admiral and the Painted Lady and one or two Clouded Yellows have been reported also.

I am obliged to the following contributors for their records from which a selection of the more important has been made; J. Armitage, J. Briggs, W. E. Collinson, J. H. Flint, C. R. Haxby, A. M. R. Heron, B. Lucas, R. S. Pollard, W. Reid, E. Richards, C. I. Rutherford, C. C. Smith, D. Wade, P. Winter, A. Wright.

Pieris brassicae, rapae, napi L. (Whites). All three species seemed rather down in numbers with no large migration.
Colias croceus Fourc. (Clouded Yellow) (61) Welwick salt marsh, near Hull, a male seen by Mrs. B. S. Pashby, 20/8/66; Brandesburton Gravel Pits, near Hull, another male, 10/9/66; D.W.
Gonepteryx rhamni L. (Brimstone) (63) Carlton, Barnsley, 9/7/66; J.A. The only record.
Argynnis aglaia L. (Dark Green Fritillary) (62) Pickering, 7/66; B.L. This butterfly does not appear to have been noted in any quantity in recent years.
A. selene Schiff. (Small Pearl-bordered Fritillary) (62) Pickering; B.L. This is the only report. None have been seen on Skipwith Common and I fear the flooding of its breeding area may have affected it here.
Nymphalis io L. (Peacock) (62) Pickering, 3/9/66; S.M.J. Scarborough, several, 9/66; R.S.P. (63) Thorne Moor, two nests of larvae; Doncaster, an imago; A.W. (64) Barlow, 19/8/66; S.M.J. Ulleskelf, commonly, 28/8/66; J.B. and C.R.H.
Vanessa cardui L. (Painted Lady) A good year and noted by most observers, sometimes in large numbers as at Spurn during the late summer. (62) Strensall, 28/5/66; J.H.F., is the earliest record.
V. atalanta L. (Red Admiral) A good migration year and reported by many members in August, September and well into October. Hundreds were seen, together with *V. cardui* and some Whites, travelling south at (61) Spurn, 7/9/66; S.M.J. (64) Barlow, late May, the earliest record; S.M.J.
Melanargia galathea L. (Marbled White) (61) Burdale and Cowlam, 30/7/66; E.R., C.I.R., and others. After only a single record in 1965, it is pleasing that this butterfly was found not uncommonly at these localities on the occasion of the Entomological Section's excursion.
Pararge aegeria L. (Speckled Wood) (64) Bishop Wood, 8/6/66, 15/7/66; C.C.S. The only reports.
Eumenis semele L. (Grayling) (61) Burdale and Kiplingcotes, 31/7/66; E.R.
Maniola tithonus L. (Gatekeeper) (61) Near Holme-on-Spalding Moor, several seen in the very warm early evening, 15/8/66; S.M.J.
Coenonympha tullia Mull. (Large Heath) (63) Thorne Moor, early June; A.W. Rawcliffe Moor, rather more commonly, 29/6/66; S.M.J.

Hamearis lucina L. (Duke of Burgundy) (62) Gundale; S.M.J. As many members are aware, this well known, almost classic, locality at Pickering for this butterfly, and many other local species, is rapidly changing owing to extensive tree felling. It is hoped that the subsequent replanting of the Haugh Rigg slopes will be circumspect. Ellerburn Bank, 28/5/66; C.I.R.

Pyrgus malvae L. (Grizzled Skipper) (61) South Cave, several seen in a railway cutting, 31/5/66; C.I.R. An important new locality.

Thymelicus sylvestris Pod. (Small Skipper) (61) Burdale, common, 30/7/66; C.I.R. (64) Harrogate, 9/7/66; P. Bates (*teste* C.I.R.), the first record for this area.

Acherontia atropos L. (Death's Head Hawk) (64) Pannal, near Harrogate, 12/9/66; P. Kay (J.B.). The only report.

Herse convolvuli L. (Convolvulus Hawk) (61) Spurn, one, 10/9/66; J.B. (62) Cayton Bay, a male in perfect condition found on a path by Mrs. Flint, 15/8/66; J.H.F. Scarborough, one found resting on a blue rug hanging on a line, 10/10/66; R.S.P. Surely this moth had an impaired sense of camouflage!

Lasiocampa quercus var. *callunae* Palm. (Northern Eggar) Larvae were reported to be scarcer than usual on both the West and North East Yorkshire moors, but about 100 were found by the Oxford University team on the Bingley moors in June (C.R.H.).

Eilema lurideola Zinck (Common Footman) (61) Barlby, at light, 8/66; S.M.J. The nearest to Selby that I have seen this moth.

Amathes castanea Esp. (Neglected) (64) Harrogate, a few in early September; C.I.R.

Diarsia dahlii Hubn. (Barred Chestnut) (64) On the moors near Brimham Rocks, one, 26/8/66; C.I.R. Very local in Yorkshire and apparently less frequently met with than formerly although 1966 appears to have been a good year for it.

Eurois occulta L. (Great Brocade) (63) Birkenshaw, Bradford, two at light, 28/8/66; W. Jagger (J.B.). Surprisingly, this is the only record I have for this notorious migrant.

Hadena nana Hufn. (Shears) (64) Malham Tarn, 6–14/6/66, a dark form taken fairly commonly; J.B.

Eumichtis lichenea Hubn. (Feathered Ranunculus) (61) Filey, one, 19/9/66; P.W. The first record from there since Porritt's list (R.S.P.). It has been taken further south at Spurn in recent years.

Apamea oblonga Haw. (Crescent Striped) (61) Spurn, one, 24/7/66; C.I.R. The first record for many years though probably quite established in this locality.

A. scolopacina Esp. (Slender Brindle) (63) Birkenshaw, Bradford, one at light, 17/8/66; W. Jagger (J.B.). A woodland species, scarce in this area and possibly a stray.

Aporophyla lututenta Borkh. (Deep Brown Rustic) (61) Muston, Filey, three, 14–23/9/66; P.W.

Dasypolia templi Thundb. (Brindled Ochre) (61) Muston, Filey, several, 10/66; P.W. Taken at Scarborough every year; R.S.P. These records are interesting as the species, once so common in the West Riding, has virtually disappeared.

Leucania littoralis Curt. (Shore Wainscot) (61) Spurn, one, 24/7/66; C.I.R. Although it is well known from this locality, its present status is not very clear. Many members have visited Spurn in recent years but the moth has not hitherto been reported since 1951 when I took the insect myself.

L. unipuncta Haw (American Wainscot) During the past autumn there was quite an influx of this scarce migrant but mainly in southern parts of the country. A single specimen taken at (61) Filey, 23/9/66 by P.W. is, as far as I am aware, the first report of the species in Yorkshire and accordingly qualifies for the most important record of the year.

Stilbia anomala Haw. (Anomalous) (64) Baildon Moor, 7/8/66; P. Kay (J.B.). There is little doubt that this confirms the old record from the Bradford area in Porritt's list. In recent years it has only been taken at Grassington, where it is common, but three have been taken at Malham Tarn, 12/8/66; J.B.

Amphipyra pyramidea L. (Copper Underwing) (63) Sheffield, one, 9/66; W.R.

Amphaloscelis lunosa Haw. (Lunar Underwing) (61) Barlby, a few at light, 9/66; S.M.J. Filey, commonly; P.W. Apparently absent from the West Riding.

Tiliacea aurago F. (Barred Sallow) (64) Larvae plentiful west of York, 5/66; C.I.R.

Panemeria tenebrata Scop. (Small Yellow Underwing) (64) Gateforth, several noted by canal side, 6/66; S.M.J.

Plusia interrogationis L. (Scarce Silver Y) (63) Denholme Moors, one, 6/8/66; P. Kay, (J.B.).

Sterrha sylvestraria Hubn. (Dotted Border Wave) (62) Strensall, 1/7/66; E.R.

Scopula emutaria Hubn. (Rosy Wave) (61) Spurn, a female, 24/7/66; C.I.R. Ova were obtained from this moth and a second brood reared in October.

Cosymbia albipunctata Hufn. (Birch Mocha) (61) Skipwith Common, one, 16/6/66; S.M.J. Only discovered in this locality in recent years.

Philereme vetulata Schiff. (Brown Scallop) (64) Selby, 6/6/66, two larvae from Alder Buckthorn. I also beat out larvae in another locality in the same district last year and although the species had not been recorded for the past fifteen years it is evidently still established; S.M.J.

Lygris prunata L. (Phoenix) (61) Muston, Filey, two, 11/8/66; P.W. Now very local and scarce in Yorkshire.

Chloroclysta miata L. (Autumn Green Carpet) (64) Grassington, larvae common, 8/66; two moths seen in daylight, an unusual event, 15/10/66; S.M.J.

Colostygia salicata Hubn. (Striped Twin-spot Carpet) (64) Brimham Rocks, on nearby moors, 8/6/66; C.I.R. Grassington, 11/8/66; A.M.R.H. The latter is the only other locality where it has been noted in recent years.

Hydrelia flammeolaria Hufn. (Small Yellow Wave) (63) Edlington Wood, Doncaster, several, 18/6/66; C.I.R. and others.

Perizoma affinitata Steph. (Large Rivulet) (61) Filey, 6/6/66; P.W. (64) Scotton Banks, Knaresborough, 21/6/66; C.I.R. Very local in Yorkshire generally, it appears to be established in the Harrogate area.

P. minorata Treits. (Heath Rivulet) (64) Dib Scar, abundantly, 8/8/66; C.I.R.

Nyctosia obstipata F. (The Gem) (61) Muston, Filey, 17/10/66; P.W. (63) Triangle Halifax; W.E.C. Two reports of this rather rare migrant.

Eupithecia albipunctata Haw. (White Spotted Pug) (64) Headingley, Leeds, 18/8/66; C.C.S. Harrogate, occasional adults, but no larvae yet found; C.I.R.

E. virgaureata Doubl. (Goldenrod Pug) (61) Thixendale, larvae on Ragwort, 10/9/66; S.M.J.

E. lariciata Frey. (Larch Pug) (64) Bishop Wood, commonly, 15/7/66; C.C.S. Harrogate, melanic adults reared from larvae taken in pine woods; C.I.R.

E. valerianata Hubn. (Valerian Pug) (64) From larvae taken in Grass Wood in 1964, two adults emerged in 1965 and six in May/June 1966; C.I.R. This is the only instance known to me of any species of this genus spending two winters in the pupal stage.

Abraxas sylvata Scop. (Clouded Magpie) (63) Barnsdale Bar, larvae swarming on Wych Elm, 9/66; A.W. (64) Bishop Wood, larvae, 20/8/66; C.C.S.

A. grossulariata var. *varleyata* Porr. (Magpie) This form continues to appear wild in small numbers in the Bradford area from which it was first obtained. (63) Low Moor, two reared; P. Kay. Little Horton, one; J.B.

Deuteronomus fuscantaria Haw. (Dusky Thorn) (61) Barlby, a few at light, 9/66; S.M.J.

Selenia lunaria Schiff. (Lunar Thorn) (64) Malham Tarn, in light trap, 13/6/66; J.B.

Apocheima hispidaria F. (Small Brindled Beauty) (64) Bishop Wood, three, 6–18/3/66; P. Kay (J.B.). Confirms Porritt's record from the same locality.

Procris statices L. (Forester) (64) Harrogate, several adults, 20/6/66; P. Bate (C.I.R.). New to the Harrogate list.

BOTANY

(Dorothy R. Walker): In the early months of the year the weather alternated between periods of bitter cold, a week or two of mild weather, then back to cold with frost and snow. Consequently flowering dates for the earlier plants tended to be late. In the Middlesbrough area garden crocuses were still in flower at Easter.

Weather conditions were severe in April. One heavy snowfall in the Halifax area did extensive damage to trees, breaking off many large branches. Birches in particular suffered badly. Plants in general were late in moving and many did not flower well. Bilberry was an exception: it flowered well and produced a good crop of berries.

The strong wind of 22nd May (70 m.p.h.) did considerable damage, blowing over a number of fairly large trees and bringing down many branches. This gale came at a very vulnerable time for many trees. From north to south of the western two-thirds of Yorkshire the story is the same; trees in young leaf, beech, sycamore, birch, oak, horse chestnut, alder and hawthorn, all suffered badly on their west-facing sides. In Wharfedale by 6th June it became clear which species were most affected; ash not at all, no leaves being out on 22nd May. Later it flowered abundantly as it is reported to have done over the whole county. Elm, sycamore and hawthorns were fairly badly hit and horse chestnut was very badly affected. Beech trees, both the common and copper varieties, were badly damaged; silver birch only slightly so in exposed places. As the season progressed new growth came from the affected branches and this was particularly noticeable in beech where it was possible to see in which parts of the county beech had been in leaf at the time of the gale. In Swaledale above Keld, some were seen with all leaves quite normal and there was no reason to think they had missed the gale, suggesting they had been later in coming into leaf. From the Thirsk area the story of the gale is the same and, whilst many trees never appeared to recover from the check, there was on others more secondary growth than in most years. The same pattern was found in the Harrogate, Nidderdale and Wensleydale areas.

On Grassington Moor the flowering of Cloudberry was a sight never to be forgotten; big patches were spangled with flowers like a strawberry bed. Later, a search for fruit was, literally, nearly fruitless. Whilst not all the flowers are pistillate here there was a good crop two years ago and the discrepancy was too great to be explained this way. Were insect or the weather responsible?

Flowering in general has been good in upper Wharfedale. *Dryas* fruited well on the north side of Cowside Beck and there were 32 spikes of *Actaea* in the Grass Woods stand. A new find in the woods was one plant of *Symphytum tuberosum. Serratula tinctoria* was scarce this year and the few plants of *Hypericum montanum* were fewer still.

From Richmond it is reported that the small teasel, *Dipsacus pilosus* flowered particularly well as the land on which it grows has not been grazed for some months. It is also increasing in another station. Sloes have been very poor in that area apart from those on high ground where flowering was late.

Marsh Orchids in the East Riding were reported to have been two or three weeks later in flowering than is usual. *Campanula glomerata* gave a particularly good show.

From Middlesbrough it is recorded that cherries, apples and pears all came into bloom towards the end of April and in profusion. The autumn correspondingly has seen a good crop of fruit, from the bramble to the rowan. An exceptionally good autumn flowering of hardy annual weeds is recorded from many areas.

Farm crops are said to have been fair in the Catton area but the weed problem has been acute. Fields have been thick with Persicaria particularly where potatoes are growing. It is also reported from here that horse chestnuts flowered fairly well but that there has been the worst crop of 'conkers' for 30 years.

PLANT RECORDS: EAST RIDING (E. Crackles)

Following the important discovery of *Sison amomum* (Stone Parsley) at Paull in 1963, this species was found in a second locality along the Humber bank at Patrington on the occasion of the Y.N.U. Excursion. Miss Crackles has found a further locality for *Bupleurum tenuissimum* on the river bank at Skeffling. Mr. Chicken found *Cyperus longus* in marshy ground in an old chalk quarry at Hessle and *Dipsacus pilosus* in the same pit. Both species are presumably introductions, but are mentioned here in case there are any subsequent records for these species in the vice-county.

Additional records for a number of species which are rare or very local in East Yorkshire have also been reported.

Recorders:—Miss E. Crackles (E.C.), E. Chicken (E.Ch.), T. F. Medd (T.F.M.).

Ranunculus hederaceus L. Millington pastures, 1965; Dr. A. Wegener per Miss C. M. Rob.

Papaver lecoqii Lamotte Between Fridaythorpe and Thixendale; E.C.

Fumaria parviflora Lam. Near Weaverthorpe; E.C.

Geranium columbinum L. Near Weaverthorpe; E.C.

Ononis spinosa L. Humber bank at Patrington; Y.N.U. Excursion.

Lotus tenuis Waldst. & Kit. ex Willd. Along the Humber bank at Patrington and Kilnsea; Y.N.U. Excursion. Also still at Hessle on the foreshore, confirming a record of 1897; E.C.

Astragalus danicus Retz. Chalk quarry, Thwing; E.Ch.

Oenanthe lachenalii C.C. Gmel. Kilnsea; Y.N.U. Excursion.

Thymus pulegioides L. Thixendale, South Cave and Goodmanham; E.C.

Galium mollugo x *verum* = *G.* x *pomeranicum* Retz. Thixendale; Dr. W. A. Sledge.

Inula conyza DC. Hessle chalk pits; E.C. and P. M. Garnett.

Serratula tinctoria L. Thixendale; E.C.: Eastdale; E.Ch.
Allium scorodoprasum L. Eastdale and South Cave; E.C.
Allium vineale L. Hessle; Mrs. Thistleton: Thwing; E.Ch.
Coeloglossum viride (L.) Hartm. Thixendale; E.C.
Dactylorhiza incarnata (L.) Vermeul. Thwing mere; E.Ch.
Dactylorhiza praetermissa (Druce) Vermeul. Aughton Ings; H. O. Bunce.

WEST RIDING (F. Murgatroyd)

Lycopodium clavatum L. (63) Goole Moor; Y.N.U. Excursion.
Asplenium adiantum-nigrum L. (63) Wall near Haugh End, Sowerby, Halifax; F. Murgatroyd (F.M.).
Cardaria draba (L.) Desv. (63) Thorpe Marsh, Doncaster; D. Grant & T. Schofield (D.G. & T.S.)
Stellaria neglecta Weihe (64) Wighill; T. F. Medd (T.F.M.).
Crataegus oxyacanthoides Thuill. (63) Near Thorpe Marsh, Doncaster; D.G. & T.S.
Pastinaca sativa L. (63) Swillington; D.G. & T.S. Burton Salmon; E. Thompson (E.T.).
Polygonum nodosum Pers. (64) Dringhouses and Holgate, York; T.F.M.
Pyrola minor L. (64) Riverside above Mickley; Mrs. A. Butcher (A.B.).
Veronica scutellata L. (64) Allerton Park, Knaresborough; E.T.
Euphrasia scottica Wettst. (64) Salt Lake, Ribblehead; Mrs. F. Houseman (F.H.).
Scutellaria minor Huds. (63) Near Slaithwaite; R. Crossley (R.C.).
Tragopogon pratensis L. subsp. *pratensis* (64) Roadside, Fewston; F.H.
Hieracium diaphanoides Lindeb. (63) Old Lane, Halifax; F.H.
H. pseudostenstroemii Pugsl. (64) Buckden; F.H.
Taraxacum spectabile Dahlst. (63) Colden Valley, Hebden Bridge; F.M.
Epipactis phyllanthes G.E.Sm. (64) Woods on riverside above Mickley; A.B.
Neottia nidus-avis (L.) Rich. (64) Woods on riverside above Mickley; A.B.
Listera cordata (L.) R.Br. (64) Near Embsay Reservoir; A.B.
Scirpus sylvaticus L. (64) Fairburn; E.T.
Carex boenninghausiana Weihe (*C. paniculata* x *C. remota*) (64) Oakdale, Harrogate; Miss D. R. Walker.
C. pendula Huds. (64) Riverside above Mickley; F.M.

NORTH RIDING (C. M. Rob)

During 1966 the Union held two field meetings in the Riding; in addition the B.S.B.I. spent two days in Swaledale and the Wild Flower Society one day visiting some well worked ground in Wensleydale. Though these visits all added new species to the 10 km squares investigated there are not many interesting records to report. Two new localities for *Peucedanum ostruthium* were found during the Thornton Rust meeting of the Y.N.U. and the Swaledale visit by the B.S.B.I. and Mr. Medd's record of *Myrrhis odorata* near Malton is a confirmation of a pre-1930 record in the *Atlas*. *Juncus compressus* would seem to be a recent arrival to the northern end of Castle Howard Great Lake. The whole of this lake shore has changed a great deal in the last 20 years, especially since the surrounding ground was ploughed and is now arable. In former times the shore was heavily trampled and the vegetation hard grazed; in recent years a big bed of *Carex acutiformis* has covered what was open water and there is now less *Nymphoides peltata*. A number of willows have colonised what was open grassland and amongst these willows were a number of well established plants of the *Juncus*. *Acorus calamus* is still to be found on the eastern side of the lake, but all along this bank the vegetation suffers from too much trampling by the many fishermen and other visitors. I should like to thank all who have kindly sent records and notes for this report.

Asplenium adiantum-nigrum L. (65) Red Scar, Richmond; B.S.B.I. Meeting.
Papaver lecoqii Lamotte (65) Thornton Rust; Y.N.U. Meeting.
Hornungia petraea (L.) Reichb. (65) Dovescar rocks, Waldendale above West Burton; Dr. W. A. Sledge.
Silene noctiflora L. (62) Sandhutton near York; T. F. Medd.
Claytonia perfoliata Donn ex Willd. (62) Acklam nr. Middlesbrough; I. C. Lawrence.
Trifolium striatum L. (62) Rye-hill quarry, Ayton; I.C.L.
Lathyrus sylvestris L. (62) Sandsend; Mrs. J. Holloway.
Potentilla anglica Laich. (62) Overton Wood nr. York; T.F.M.
Alchemilla glabra Neyg. (62) Old Railway, Catton; C. M. Rob.
Rosa sherardii Davies (62) Strensall; T.F.M. (65) Thornton Rust; Mrs. F. Houseman.

Rosa dumalis Bechst. (65) Thornton Rust; Mrs. F. Houseman.

Peucedanum ostruthium (L.) Koch (65) Thornton Rust; Y.N.U.: Satron, Swaledale; B.S.B.I.: Lonton in Teesdale; C.M.R.: Appersett; Mrs. D. Todd.

Myrrhis odorata (L.) Scop. (62) Broughton nr. Malton; T.F.M.

Rumex tenuifolius (Wallr.) Löve (62) Overton Wood nr. York; T.F.M.

Polygonum nodosum Pers. (62) Sandhutton nr. York, & Flamingo Park, Kirkby Misperton; T.F.M.

Verbascum nigrum L. (62) Yedmandale; Mrs. Thisleton per Miss Crackles.

Veronica catenata Pennell (62) Sandhutton; T.F.M.

Scrophularia vernalis L. (65) Camp Hill, Kirklington; C.M.R.

Euphrasia confusa Pugsl. (det. P. Yeo) (65) Thornton Rust; F.H.

Juncus compressus Jacq. (62) Castle Howard; C.M.R.

Orchis morio L. (65) Keld; Miss J. Gibbons.

Carex pilulifera L. (62) Overton Wood; T.F.M.

ALIENS AND CASUALS

(F. Houseman): Very few wool aliens have been recorded for 1966, but a number of established aliens and many plants of bird-seed origin have proved interesting.

My thanks to the following contributors for the records: Mrs. F. Draper, Mrs. J. Duncan, Mrs. Elliot, Dr. J. H. Elliott, Mr. A. Frudd, Master C. Hartley, Mr. H. R. Noltie, Dr. B. A. Kilby, Miss Kordik, Mr. T. F. Medd, Dr. G. A. Nelson, Mr. J. Oxtoby, Miss C. M. Rob, Lady Ropner, Messrs. Rowley & Williams, Miss D. Walker, Mr. G. A. Shaw, and Mr. D. McClintock.

Brassica nigra (L.) Koch (64) Garden weed, York; T.F.M.

Brassica juncea (L.) Czern. & Coss. (64) Garden weed, Burley; F.D.

Vaccaria pyramidata Medic. (64) Earthworks in Leeds Inner Ring Road; J.H.E.: Garden weed, Burley; F.D.

Melilotus indica (L.) All. (64) Garden weed, Burley; F.D.

M. sulcata Desf. (64) Garden weed, Burley; F.D.

Scorpiurus muricata L. (64) Garden weed, Burley; F.D.

Trifolium stellatum L. (64) Garden weed, Burley; F.D.

Spiraea salicifolia L. (63) Near Horbury Bridge; A.F.

S. douglasii Hook. (63) Low Moor, Bradford; D.M.

Rubus spectabilis Pursh. (64) Meanwoodside; G.A.N.

Potentilla recta L. (65) Kirklington; Lady Ropner.

Sorbus aria x *S. aucuparia* (= *S.* x *thuringiaca* (Isle) Fritsch) (64) Parlington Park; G.A.N.

Lythrum meonanthum Link (64) Garden weed, Harrogate; D.W.: Otley; F.H.

Epilobium adenocaulon Hausskn. (62) Near Rievaulx; York & Dist. Nat Soc. per Mrs. Elliott & Miss Kordik.

Bupleurum lancifolium Hornem. Bird seed introduction at (62) Catton Hall; C.M.R. (64) Burley; F.D.: York; T.F.M.

Petroselinum crispum (Miller) Turrill (64) Excavation site, York; T.F.M.

Euphorbia lathyrus L. (64) Garden weed, Wetherby; H.R.N.

Rumex pulcher L. (64) Garden weed, Burley; F.D.

Lysimachia punctata L. (64) Roadside nr. Braythorne; J.D.

Vinca minor L. (64) In track to Parlington Park, Aberford; G.A.N.

Polemonium caeruleum L. (64) Well established by wall on roadside opposite Bolton Abbey station; F.H.

Calystegia pulchra Brummitt (63) In plenty on waste ground near Spinkwell Lock, Canal Road, Bradford; G.A.S.

Lycium halimifolium Miller (63) Hedgebanks nr. Dewsbury; C.H.

Veronica peregrina L. (65) Plentiful as a garden weed, Camphill, Kirklington; Lady Ropner: and below wall of vicarage, West Tanfield; C.M.R.

V. filiformis Smith (64) Near entrance to Clapham woods; F.H.

Misopates orontium (L.) Raf. (62) Garden weed, Easingwold; F. Warner.

Parentucellia viscosa (L.) Caruel (64) Edge of newly made sports area near Bodington Hall, Leeds; B.A.K.

Mentha longifolia (L.) Huds. (64) Otley tip; F.H.

Asperula arvensis L. Bird seed alien at (62) Catton Hall; C.M.R. (64) Burley; F.D.: York; T.F.M.

Galium tricorne Stokes (64) Garden weed, Burley; F.D.

Senecio squalidus L. (61) Malton; T.F.M.

S. fluviatilis Wallr. (64) Yockenthwaite; F.H.
Petasites japonicus (Sieb. & Zucc.) Schmidt (62) Well established at Middleton Tyas; Lady Ropner.
Conyza canadensis (L.) Cronquist (64) Behind railway station, York; T.F.M.
Cirsium arvense (L.) Scop. var. *incanum* (Fisch.) Ledeb. (63) Pontefract; Rowley & Williams, per G.A.N.
Centaurea diluta Ait. Bird seed alien at (64) Harrogate; D.W.: and Burley; F.D.
Bromus willdenowii Kunth (64) Burley; F.D.
B. tectorum L. (65) Berryhills, Kirklington; C.M.R.
Phalaris paradoxa L. var. *appendiculata* (64) Bird seed alien, Burley; F.D.
Brachypodium distachyon (L.) Beauv. (64) Bird seed alien, Burley; F.D.
Setaria italica (L.) Beauv. (64) Otley tip; F.H.
S. lutescens (Weigel) Hubbard (64) Otley tip; F.H.
Panicum miliaceum L. (64) Otley tip; F.H.

BRYOLOGY

The two meetings of the bryological section, at Buttercrambe Moor Wood and Y.N.T. reserve at Strensall (V.C. 62) in April and at Greenfield (V.C. 63) in September are both reported fully elsewhere in *The Naturalist* as well as the bryological reports from the Y.N.U. field meetings. These areas were chosen in order to verify a number of old records and at both Buttercrambe and at Greenfield the habitats were found to have changed considerably; in the former case by the drying up of the lake and replanting of conifers and in the latter by erosion and atmospheric pollution.

MUSCI (M. Dalby): Several notable records were made during 1966. Mr. Branson's discovery of *Dicranum polysetum* at Birk Crag, Harrogate was a new V.C. record, and Mrs. Paton recorded *Fissidens bambergeri* which is a new county record from her visit to Jackdaw Crag Quarry, Tadcaster, last year.

Mention must be made of the work now being carried out by Mr. Branson in collaboration with Mr. J. H. Field on the *Philonotis* group. He has found that *Philonotis caespitosa* is far more widespread in the county than was previously thought and also that the Yorkshire material frequently shows a propaguliferous tendency seldom seen before in this species. Further work on the genus continues.

Two more locations for *Dicranum strictum* have been found by Mr. Branson in the Nidd valley and Skell valley bringing the total number in the county up to 20, and Mr. Shaw has refound the original station at Sunnydale, Morton, near Bingley.

I would like to thank Mr. Branson, Mr. Shaw, Mrs. Gow and Rev. G. G. Graham for their continued help in producing records of interest throughout the county.

† New county record
* New vice-county record

Sphagnum teres (Schimp.) Angstr. (64) Hartlington Gill, Wharfedale, Aug. 1966; F.E.B.
Atrichum crispum (James) Sull. (63) Greenfield & Chew Valleys, Sept. 1966; F.E.B.
†*Fissidens bambergeri* Schimpe ex Milde (64) Jackdaw Crag quarry, Tadcaster, April 1965; J. A. Paton.
F. minutulus Sull. var. *minutulus* (64) Boulders in R. Nidd, Ross Bridge, Birstwith, July 1966; F.E.B.
F. crassipes Wils. ex. B., S. & G. (64) Scotton Banks, Aug. 1966; F.E.B. & G.A.S. Addingham, May 1966; M.D.
Seligeria recurvata (Hedw.) B., S. & G. (64) Hartlington Gill, Aug. 1966; G.A.S. Scotton Banks, July 1966; G.A.S.
Dicranella schreberana (Hedw.) Dix. (64) Allerton Park, Knaresborough, July 1966; F.E.B. (65) Thornton Rust, July 1966; G.A.S.
Dicranum strictum Schleich. ex Schwaegr. (64) Spa Gill Wood, Fountains Abbey, May 1966; F.E.B.: Dacre Banks, June 1966; F.E.B.
**D. polysetum* Michx. (64) Birk Crag, Harrogate, Dec. 1965; F.E.B.
Campylopus fragilis (Brid.) B., S. & G. (63) Greenfield, Sept. 1966; G.A.S. (64) Studley Park, Oct. 1965; F.E.B.
Aloina rigida (Hedw.) Limpr. (64) Scotton Banks, July 1966; F.E.B.
Barbula spadicea (Mitt.) Braithw. (64) How Stean Beck, Middlesmoor, Oct. 1965; F.E.B.: Merryfield Glen, Pateley Bridge, April 1966; F.E.B. (65) Thornton Rust, July 1966; Y.N.U. exc. F.E.B.
B. trifaria (Hedw.) Mitt. (64) Birkham Wood, Knaresborough, Nov. 1965; F.E.B.
Trichostomum sinuosum (Mitt.) Lindb. ex Herzog (64) South Stainley, Feb. 1966; F.E.B.

Weissia controversa var densifolia (B., S. & G.) Wils. (64) Merryfield Gill, Pateley Bridge, Sept. 1965; G.A.S.

Grimmia alpicola var rivularis (Brid.) Broth. (64) Studley Park, Nov. 1965; F.E.B.

Rhacomitrium canescens (Hedw.) Brid. (64) Merryfield Gill, Pateley Bridge, April 1966; F.E.B. & G.A.S.

Discelium nudum (Dicks.) Brid. (63) Chew valley, Sept. 1966; G.A.S.

Tetraphis browniana (Dicks.) Grev. (63) Greenfield, Sept. 1966; G.A.S.

Mnium orthorhynchum Brid. (65) Coverdale, July 1966; G.A.S.

M. marginatum (With.) P. Beauv. (64) Hartlington Gill, Aug. 1966; F.E.B. & G.A.S.

Philonotis caespitosa Wils. ex Milde (63) Seal Bark Rocks and Chew valley, Sept. 1966; F.E.B. (64) Merryfield Glen, Pateley Bridge, April 1966; Brimham Moor, May 1966; Raygill Moss, Bolton-by-Bowland, June 1966; Allerton Park, Knaresborough, July 1966; F.E.B.: Grimwith Reservoir, Wharfedale, Sept. 1966; A. Hawkins: Morton near Bingley, Sept. 1966; G.A.S. (65) Thornton Rust, July 1966; F.E.B.

P. calcarea (B. & S.) Schimp. (63) Seal Bark Rocks, Greenfield; F.E.B. (64) Brimham Moor, May 1966; F.E.B. (65) Thornton Rust, July 1966; F.E.B.

Zygodon viridissimus (Dicks.) R.Br. (64) Birkham Wood, Jan. 1966; F.E.B.

**Z. conoideus* (Dicks.) Hook. & Tayl. (64) Whitewell, Hodder valley, May 1949; G.A.S.

Orthotrichum cupulatum Brid. (64) How Stean Beck, Middlesmoor, Nov. 1965; F.E.B.: Studley Park, Nov. 1965; F.E.B.

Thuidium philibertii Limpr. (64) Hartlington Gill, Aug. 1966; G.A.S.

Campylium protensum (Brid.) Kindb. (64) Birkham Wood, Knaresborough, Nov. 1965; F.E.B.: Hartlington Gill, Aug. 1966; F.E.B.

Amblystegium varium (Hedw.) Lindb. (64) Old bleach mill workings, Menston; M.D.

Acrocladium giganteum (Schimp.) Rich & Wall. (65) Thornton Rust, July 1966; Y.N.U. exc., Miss Robertson.

HEPATICAE (F. E. Branson): This has been quite a good year and I have collected about 200 records, although a large number of them are for the commoner species.

Three new county records and two vice-county records must be mentioned:—

†*Jungermannia lanceolata* L. (64) Considered to be extinct in the British Isles, was found by Mr. H. J. B. Birks in Twistleton Glen, Ingleton on 29th Aug. 1963 (a small clump) and he subsequently found it in two nearby localities in the Glen on 1st Jan. of this year.

†*Colura calyptrifolia* (Hook.) Dum. (64) Also from Twistleton Glen, Ingleton by Mr. Birks on 1st Jan. 1966.

**Calypogeia trichomanis* (L.) Corda emend. Buch (63) Collected from a stone dam, base of Seal Bark Rocks, nr. Greenfield on 17th Sept. 1966 by F. E. Branson.

Scapania scandica (Arn. & Buch) Macv. All records of *Scapania curta* are now invalid as probably most of them are *S. scandica.* The *Census Catologue of British Hepatics* (4th edition) gives this as occurring in :—

* (64) — Dew Bottoms, coll. C. A. Sinker, 1964.
† (65) — Far Askew Gill, Sedbergh, coll. J. Appleyard, 1950.

A very interesting discovery was made by Mrs. M. Gow at Cautley Spout, near Sedbergh (V.C. 65) on 19th Sept. 1965 in *Frullania fragilifolia* (Tayl.) Tayl. ex Gottsche, Lindenb. & Nees. She discovered another large patch of it, scattered over rocks, in the same valley in Sept. of this year. This species was last recorded from Cautley Spout by W. H. Burrell in 1917. In Yorkshire it is only known in the West Riding and is a very rare species. The following deserve special mention:—

Reboulia hemisphaerica (L.) Raddi (64) Hartlington Gill, Wharfedale, Aug. 1966; G.A.S., F.E.B.

Riccardia multifida (L.) Gray (64) Near Brimham Moor, Mar. 1966; F.E.B. Heber's Ghyll, Ilkley, Oct. 1965; F.E.B.

Pellia neesiana (Gottsche) Limpr. (64) Allerton Park, nr. Knaresborough, July 1966; F.E.B. (4th Yorkshire record).

Blasia pusilla L. (64) Holden Clough, Bolton-by-Bowland, June 1966; M.D.

Fossombronia pusilla (L.) Dum. (65) Piercebridge, July 1965; G.A.S.

Ptilidium pulcherrimum (Weber) Hampe (64) Middlesmoor, nr. Pateley Bridge, Oct. 1965; M.D., F.E.B.

Lepidozia pearsonii Spruce (64) Twistleton Glen, Ingleton, Jan. 1966; J. Birks.

Calypogeia neesiana (Mass. & Carest.) K. Mull. var. *meylanii* (Buch) Schuster (64) Merryfield Glen, Pateley Bridge, Apl. 1966; F.E.B.

Lophozia incisa (Schrad.) Dum. (65) Cautley Spout, nr. Sedbergh, Sept. 1966; Mrs. M. Gow.

Leiocolea bantriensis (Hook.) Jorg. (65) Uldale, nr. Sedbergh, Sept. 1966; Mrs. M. Gow.

Tritomaria quinquedentata (Huds.) Buch (65) Thornton Rust, July 1966; F.E.B.

Tritomaria exsectiformis (Breidl.) Schiffn. (64) Reynard Crag, Birstwith, Mar. 1966; F.E.B. Nr. Brimham Moor, Mar. 1966; F.E.B.

Anastrepta orcadensis (Hook.) Schiffn. (64) Twistleton Glen, Ingleton, Jan. 1966; J. Birks.

Solenostoma sphaerocarpoidea (De Not.) Paton & Warb. (64) Hartlington Gill, Wharfedale, Aug. 1966; F.E.B.

Nardia compressa (Hook.) Gray (64) Merryfield Glen, nr. Pateley Bridge, May 1966; F.E.B.

Marsupella emarginata (Ehrh.) Dum. (64) Merryfield Glen, nr. Pateley Bridge, May 1966. Nr. Brimham Moor, Mar. 1966. Birk Crag, Harrogate, Feb. 1966. How Stean Beck, Middlesmoor, Oct. 1965; F.E.B.

Mylia anomala (Hook.) Gray (65) Thornton Rust, July 1966; F.E.B.

Chiloscyphus pallescens (Ehrh.) Dum. (63) Agden Bog, nr. Bradfield, May 1966; Mrs. M. Gow: Chew Valley, nr. Greenfield, Sept. 1966; F.E.B. (64) Brimham Moor, May 1966; F.E.B.

Cephalozia connivens (Dicks.) Lindb. (65) Thornton Rust, July 1966; F.E.B.

C. media Lindb. (64) Birk Crag, Harrogate, Dec. 1965; F.E.B.

Nowellia curvifolia (Dicks.) Mitt. (64) Holden Clough, Bolton-by-Bowland, June 1966; M.D.

Odontoschisma sphagni (Dicks.) Dum. (65) Thornton Rust, July 1966; F.E.B.

Scapania scandica (Arn. & Buch) Macv. (64) Nr. Ribblehead, Mar. 1965; J. A. Paton.

Radula complanata (L.) Dum. (64) Hartlington Gill, Wharfedale, Aug. 1966; F.E.B., G.A.S.

Frullania tamarisci (L.) Dum. (64) Hartlington Gill, Wharfedale, Aug. 1966; G.A.S., F.E.B.

JOINT VERTEBRATE SECTIONS MEETINGS, 1966

The first of the year's meetings, both of which had Mr. T. M. Clegg as Chairman, was held on 19th March. It was a beautiful day and some members obviously preferred field work on such a day as only 64 attended in the afternoon and 96 in the evening. The reports of ornithology in the county and at Spurn by Mr. J. Cudworth and Mr. J. K. Fenton were a review of the previous six months rather than an annual report which at this date would probably be 'history' to the majority of listeners and, in any case, full annual reports were published. A number of short papers concluded the afternoon session; three were on some of the rarer species recorded in the county in 1965, and were by Major Worrin and Messrs. Stead and Densley. The other paper was by Mr. J. R. Mather who, with the help of skins, described his work on divers, particularly White-billed. He also showed skins of a series of Pied and White Wagtails with an invitation to the audience to differentiate them during the interval. For the Fishes, Amphibians, Reptiles and Mammals Section Mr. Govett gave details of a Yorkshire Mammals Survey and also a National Fish Enquiry, and Mrs. Hazelwood mentioned a National Frog Survey. After tea Mr. A. J. Clissold gave a talk on ringing Whooper Swans in Iceland. With the aid of both colour slides and film he described three expeditions as a result of which approximately 500 Whoopers had been ringed.

An attendance at the meeting on 15th October of 107 for the afternoon session was very pleasing. The business meetings of the Sections occupied the whole of the afternoon but during the interval a number of small mammals' skins were exhibited by the chairman who referred to interesting details in connection with a number of species. An audience of nearly 200 assembled after tea to hear Mr. J. S. C. Monro on 'Birds of Teesmouth'. This often beautifully photographed sound colour film incorporated bird calls recorded by Mr. John Kirby. An excellent production. The society roll-call indicated 25 societies being represented and the collection taken amounted to £11. 15. 0. Both the collection and the number of people present were the highest for many years. Although a Vertebrate Sections' meeting, in view of the importance of the Teesdale Defence Fund it was suggested that the collection be donated to it, and subsequently a letter of appreciation was received. It should also be recorded that the lecturer declined his fee and asked that it be sent to the R.S.P.B. A very successful meeting.

J. Keith Fenton.

THE YORKSHIRE

PROFIT AND LOSS ACCOUNT

EXPENDITURE

1965 £ s. d.			£ s. d.	£ s. d.
	GENERAL PRINTING:			
28 10 0	Members' Cards		32 4 0	
98 17 7	Circulars		74 19 1	
				107 3 1
	The Naturalist:			
600 7 2	Cash Paid		728 16 1	
3 0 0	Editor's Expenses		5 10 0	
603 7 2			734 6 1	
142 18 4	*Less* Sales to non-members		152 0 7	
460 8 10				582 5 6
54 19 0	Extra Pages and Illustrations		57 15 0	
– – –	*Less* Cash from Y.N.T.	£13 10 0		
19 5 0	*Less* Transfer Ornithological A/c.	£17 10 0		
			31 0 0	
35 14 0				26 15 0
	SUNDRY EXPENSES:			
28 17 5	Officers' Expenses		32 9 3	
24 14 7	Duplicating and Stationery		15 6 6	
6 16 0	Bank Charges		15 13 6	
1 0 0	Subscriptions and Donations		12 10 0	
13 13 2	Miscellaneous		– – –	
– – –	Spraying Symposium		10 0 0	
– – –	Cost of Circular Letter		19 4 9	
75 1 2				105 4 0
164 8 10	PROFIT FOR YEAR			59 9 7
£863 0 5				£880 17 2

BALANCE SHEET as

£ s. d.			£ s. d.	£ s. d.
	ACCUMULATED FUNDS — GENERAL			
100 0 0	Booth Fund		100 0 0	
100 0 0	Cheesman Fund		100 0 0	
250 0 0	R. C. Fowler Jones Legacy		250 0 0	
100 0 0	E. G. Bayford Legacy		100 0 0	
500 0 0	R. Chislett Legacy		500 0 0	
1050 0 0				1050 0 0
	MYCOLOGICAL FUND:			
113 12 7	Balance brought forward		126 17 2	
13 4 7	*Add* Sales of Cortinarius		13 10 9	
126 17 2			140 7 11	
– – –	*Less* Offprints from *The Naturalist*		7 14 0	
126 17 2				132 13 11
1147 6 0	ORNITHOLOGICAL FUND — Capital			1147 6 0
	Revenue:			
	Balance brought forward		17 19 0	
	Interest on Investments		63 0 0	
			80 19 0	
17 19 0	*Less* Sundry payments		26 15 0	
				54 4 0
	LIFE MEMBERS ACCOUNT:			
145 15 0	Balance brought forward		131 15 0	
14 0 0	Less Transfers — Subscriptions		14 0 0	
131 15 0				117 15 0
	SUNDRY CREDITORS:			
36 5 0	Subscriptions paid in advance		70 19 0	
10 13 6	Due to Editor of *The Naturalist*		5 10 0	
46 18 6				76 9 0
	PROFIT AND LOSS ACCOUNT:			
	Balance brought forward		723 10 9	
	Add Profit		59 9 7	
			783 0 4	
	Less Cost of List of Subscribers to Chislett Memorial Fund	£7 10 6		
	Less Cost of Exhibition	£56 0 3		
			63 10 9	
723 10 9				719 9 7
£3244 6 5				£3297 17 6

NATURALISTS' UNION

Year to 30th September, 1966

INCOME

1965 £ s. d.		£ s. d.
669 9 8	Subscriptions and Donations	708 14 9
32 11 3	Interest on Dividends and Tax	21 4 4
31 15 5	Bank Interest	20 7 1
29 0 1	Sale of Publications	21 7 2
100 4 0	Income Tax Repayable — Covenants	109 3 10
£863 0 5		£880 17 2

at 30th September, 1966

£ s. d.		£ s. d.	£ s. d.	£ s. d.
	INVESTMENTS (at cost):			
	ORNITHOLOGICAL ACCOUNT:			
	Nicholas Fund 3% British Transport	100 0 0		
	Chislett Legacy:			
	£600 Treas. Stk. 5½% 2008-12	545 9 0		
	£600 Treas. Stk. 5% 1986-89	501 17 0		
			1147 6 0	
	GENERAL ACCOUNT:			
	Booth Fund 3½% Conversion Stock	100 0 0		
	Cheesman Fund 3½% War Stock	100 0 0		
	4% Consols (Bank of England)	200 0 0		
	4% Consols (Post Office)	159 10 11		
	300 Unilever Ordinary Shares	522 1 6		
	250 Shell Trans. Ord. Shares	511 7 0		
			1592 19 5	
			2740 5 5	
	Less Reserve for Depreciation		235 0 0	
2505 5 5				2505 5 5
	BANK ACCOUNTS:			
	Yorks. County Savings Bank		403 16 3	
	Interest accrued		16 2 0	
			419 18 3	
	Current Account Westminster Bank		192 19 6	
518 0 8				612 17 9
	SUNDRY DEBTORS:			
	Subscriptions unpaid	£15 4 8		
	Less Reserve for Bad Debts	£10 0 0		
17 14 9			5 4 8	
109 6 0	Income Tax repayable		109 3 11	
1 15 0	Dividend accrued		– – –	
92 4 7	Cash in Transit		65 5 9	
221 0 4				179 14 4
£3244 6 5				£3297 17 6

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
4-6 Harrison Road,
Halifax.

10th December, 1966.

BRYOLOGICAL MEETING AT GREENFIELD, V.C. 63

17th–18th September, 1966

F. E. BRANSON

On a memorable occasion, 15th June, 1832, William Wilson of Warrington, the greatest of British bryologists and author of *Bryologia Britannica* (1855), together with Mr. Crozier and a local farmer (also a bryologist), Jethro Tinker, walked from the public house called "Bill's o' Jacks", now demolished, up to Seal Bark Rocks, not far from the Yorkshire-Lancashire border. In Wilson's own words, "From 'Bill's o' Jacks' we crossed a wide tract of peat-bog, swampy from recent rains, to the narrow head of the valley, where, on the left, we arrived at Seal Bark, the station of *Hymenophyllum*, consisting of huge loose blocks of grit-stone piled loosely upon each other into a hollow, which they have not completely filled. Above, there is a craggy rock, from which the masses have been detached. In the vacancies underneath the loose blocks was found *Hymenophyllum wilsoni*. We saw *Hymenophyllum tunbridgense* in a very small deep hole at a greater elevation, under the first rocky knoll. This station has long been known to Jethro; and this season we could find very little of either species, and it was much withered and blackened".

The area has greatly changed since Wilson's day. Two large reservoirs, Yeoman Hey Reservoir and further up Greenfield Reservoir, have been constructed in the valley and these have obliterated the wet peat-bogs mentioned above. The area has now an aspect of desolation. The atmospheric pollution from the industrial cities has made serious depredations on the vegetation, killing most of the heather and trees. Looking across the valley one could see it filled with a bluish haze of smoke. We were pleased to have with us on both days of the meeting, Miss M. E. Newton, B.Sc., and Miss A. C. Chadderton. On the first day we followed Wilson's route up the valley, by the left side of the reservoirs and along the stream to Seal Bark Rocks. It is today a barren area and most of the bryophytes and plants recorded by Wilson, including the *Hymenophyllums*, have vanished. At Seal Bark we found the hepatic *Mylia taylori* and the mosses *Cratoneuron commutatum* var. *commutatum*, *Hyocomium flagellare* and *Tortella tortuosa* mentioned by Wilson. Naturally the most lush place was along the stream at the bottom of the valley. One of the most pleasing things seen was some large patches of *Atrichum crispum* at various places at the side of the stream. The commonest hepatic, which was literally everywhere on the peaty formations, was undoubtedly *Gymnocolea inflata*. Submerged in the stream was an abundance of the two hepatics *Nardia compressa* and *Scapania undulata*. I gathered the true *Calypogeia trichomanis* (with the blue oil bodies in the cells) on a stone dam at the base of Seal Bark Rocks. This is a vice-county record for V.C. 63. Another V.C. record was *Solenostoma cordifolium* growing in a greyish mass on the side of a conduit running into Yeoman Hey Reservoir. *Solenostoma spp.* are very uncertain to determine in the absence of perianths and none were present on our specimens. However, the cellular structure and other characteristics led to its being accepted by the B.B.S. recorder for hepatics (Mrs. J. A. Paton). Of the mosses, *Philonotis fontana*, *P. caespitosa* and *P. calcarea* occurred in marshy places all along the valley. I had *P. calcarea* var. *laxa* from the side of a conduit running into Yeoman Hey Reservoir, but this variety is now absorbed with the type. Miss Newton found *Brachydontium trichodes* higher up the valley. Mr. Shaw discovered *Tetraphis browniana* on some wet dripping cliffs. From the point of view of the number of species seen the meeting was somewhat of a disappointment, but in the investigation of certain individual species (e.g. *Philonotis*) it proved a great success. The surprising thing was not the species present but the number of species which should have been there but were absent! For example, no *Pleurozium schreberi* or *Rhytidiadelphus squarrosus* was seen and *Dicranum scoparium* which is usually abundant in such habitats I saw once and in minute quantity. Many of the specimens gathered were not at all typical, being very depauperate and they gave great difficulty in determination, especially the *Grimmias* and *Rhacomitriums*. The moss *Orthodontium lineare* which was first observed in 1920 near Greenfield was also seen with capsules. It has since then spread rapidly and is now found abundantly in various localities in England.

On the second day we went along the Chew Valley. Here very similar conditions prevailed as on the previous day — barrenness, desolation and pollution. The species seen were much the same in the main. Mr. Shaw found *Dicranella rufescens* (fine fruiting material) and *Discelium nudum* on a bank. I had some *Dicranella palustris* with capsules, a species rarely seen in fruit. There was an abundance of *Philonotis spp.* in marshy places along the valley, much more than was observed on the previous day. Most of the *Philonotis caespitosa* was propaguliferous and thus able to spread rapidly by vegetative means. This accounts for the mixed specimens of *P. caespitosa* and *P. fontana* which I collected. A parallel case is in the spread of *Dicranum strictum* by vegetative means in certain places in Yorkshire. An analysis of the 19 packets of *Philonotis spp.* which I collected is as follows:—

SEAL BARK ROCKS:

Philonotis fontana (1 pkt.), *P. caespitosa* (1 pkt.), *P. fontana* + P. *calcarea* (mixed) (1 pkt.), *P. fontana* + *P. caespitosa* (mixed) (4 pkts.), *P. calcarea* var. *laxa* (1 pkt.).

CHEW VALLEY:

P. fontana (5 pkts.), *P. caespitosa* (5 pkts.), *P. fontana* + *P. caespitosa* (mixed) (1 pkt.).

A list of species (other than those mentioned above) noted during the meeting is as follows. I can conclude with the comment: 'A very interesting report from a very poor district!'

Nomenclature and arrangement follow *Census catalogue of British Mosses* (3rd edition) by E. F. Warburg for mosses; and *Census catalogue of British Hepatics* (4th edition) by J. A. Paton for hepatics. I am very grateful to Mr. R. D. Fitzgerald, Dr. A. J. E. Smith, Mr. A. C. Crundwell and Mrs. J. A. Paton for checking certain species, and to John H. Field for patiently checking all the *Philonotis* specimens. Also to Miss M. Dalby for the determination of the *Sphagna*.

HEPATICAE:

Thalloid:

Riccardia sinuata
R. pinguis
Pellia epiphylla
P. endiviifolia

Foliose:

Lepidozia reptans
Calypogeia muelleriana
C. fissa
C. arguta
Lophozia ventricosa
Barbilophozia floerkei
B. attenuata
Nardia scalaris
Plagiochila asplenioides var. *asplenioides*
Lophocolea bidentata
L. cuspidata
Chiloscyphus polyanthos
C. pallescens
Cephalozia bicuspidata
Diplophyllum albicans

MUSCI:

Sphagna:

Sphagnum papillosum
S. squarrosum
S. recurvum
S. cuspidatum
S. subsecundum var. *auriculatum*
S. fimbriatum
S. plumulosum

Acrocarpi:

Atrichum undulatum
Oligotrichum hercynicum
Polytrichum aloides
P. aurantiacum
P. commune
Fissidens bryoides
F. osmundoides
F. adianthoides
Pleuridium acuminatum
Ceratodon purpureus var. *purpureus*
Dicranella cerviculata
D. heteromalla
Dichodontium pellucidum
D. pellucidum var. *flavescens*
Campylopus pyriformis
C. flexuosus
Tortula muralis
Barbula convoluta
B. recurvirostra
Grimmia trichophylla
Rhacomitrium aciculare
R. fasciculare
R. lanuginosum
Funaria hygrometrica
Tetraphis pellucida
Pohlia nutans
P. annotina
P. wahlenbergii
P. delicatula
Bryum pseudotriquetrum
B. pseudotriquetrum var. *bimum*
B. caespiticium
B. argenteum
B. capillare
Mnium hornum
M. punctatum
Aulacomnium palustre

Pleurocarpi:
- *Cratoneuron filicinum*
- *C. commutatum* var. *falcatum*
- *Drepanocladus fluitans*
- *D. exannulatus*
- *D. uncinatus*
- *Hygrohypnum ochraceum*
- *Acrocladium stramineum*
- *A. cuspidatum*
- *Brachythecium rutabulum*
- *B. rivulare*
- *B. plumosum*
- *Eurhynchium praelongum*
- *E. riparioides*
- *E. murale*
- *E. confertum*
- *Isopterygium elegans*
- *Plagiothecium succulentum*
- *Hypnum cupressiforme*
- *H. cupressiforme* var. *ericetorum*
- *Ctenidium molluscum*

CORRESPONDENCE

Dear Sir,

The letter from J. R. Mather in your October–December 1966 number discrediting my note on a wintering Turtle Dove (*The Naturalist*, April–June 1966) calls for a reply. While aware that an aviary escape was possible, those who saw the bird on numerous occasions considered it was a genuine wild example, and it was certainly at large and fending for itself during two long unbroken periods of 80 and 105 days. Due to the doubt regarding the dove's status prior to its first appearance in a rural district 12 miles east of Leeds, no field notes on the bird were sent to the ornithological recorder for V.C. 64.

The objector is entitled to his own view; but referring to his claim that of the caged Turtle Doves in existence there are 'certainly some in the Leeds and Bradford areas', since its publication we have made enquiries among local aviculturists for news of a live European Turtle Dove, but none has come to light. As for his observation on a mongrel dove three years in captivity, my opinion — endorsed by several responsible ornithologists who visited the wild bird at South Milford — is that the reference is ridiculous, with no bearing on the Turtle Dove described in my report.

Yours faithfully,

JOHN ARMITAGE

FIELD NOTE

Bupleurum tenuissimum L.

Plants of this species were found by one of us (E.C.) in August 1966, on top of the river bank near Skeffling. The habit of the plants was very different from that shewn by plants of the same species seen previously and this is correlated with the difference in situation. In this new locality, the species was found in a short vegetation consisting mainly of White Clover (*Trifolium repens* L.) and Red Bartsia (*Odontites verna* (Bell.) Dumort.) and the plants stood erect and were between three and seven inches in height. This habit is in sharp contrast to that of the plants near Paull, where it occurs on the salt-marsh side of the river bank in among patches of *Agropyron pungens* (Pers.) Roem. & Schult. and other comparatively tall vegetation. Here the stems of the plants are mainly twelve to twenty-four inches in length and exhibit a characteristic trailing habit.

It would appear that the E. Yorks. stations for *Bupleurum tenuissimum* are now the most northerly in the British Isles. The species was formerly known on Tees-side. In 1918, Professor Heslop-Harrison recorded the plant's disappearance from its old stations there due to drainage and 'industrialisation' of the neighbourhood, but its appearance 'on the margin of the Greatham salt-marsh close to the Cerebos salt works' (*Vasculum* **4**, 92). In 1925 (*ibid.* **12**, 38), Professor Heslop-Harrison stated that the species was 'much more abundant and more luxuriant this year than when first found at Greatham'. The *Atlas* signifies a post-1930 record for this species in the ten km. square containing Greatham Creek in county Durham, but we can find no record for the species near Greatham since the 1925 note. The Greatham Creek area has been searched several times in the last four years by P.M.G. without success and Rev. G. Graham, Mr. I. Lawrence and E.C. have all visited the area but have not seen *Bupleurum* there.

Our thanks are due to the Rev. Gordon Graham for references to the relevant literature.

E. CRACKLES & P. M. GARNETT

BOOK REVIEWS

On Aggression by **Konrad Lorenz,** with a Foreword by Julian Huxley. Pp. xiv + 273. Methuen. 30/-.

This is an important thought-provoking book. Lorenz is mainly concerned with intra-specific aggression and shows how the aggressive instinct not only ensures that individual members of a species are evenly spread over the available habitat, but how, through the process of 'ritualisation' this same instinct, transformed into a new autonomous instinct, becomes the basis of the social cohesion of the flock and the pack, and even of the remarkable marriage bond of the Greylag Goose. The closely-reasoned argument is illuminated by a wealth of fascinating observations, based on advanced comparative behaviour studies not otherwise easily accessible. The range of animals discussed is wide — insects, tropical fish, the rat, the wolf and many species of birds. The observation is acute, and always enlivened by Lorenz's delightful sense of humour.

He is also concerned with aggression in man. He argues that 'knowledge springing from conceptual thought robbed man of the security provided by his well-adapted instincts long, long before it was sufficient to provide him with an equally safe adaptation'. This is man's dilemma. 'The deep emotional layers of our personality simply do not register the fact that the crooking of the forefinger to release a shot tears the entrails out of another man.' Despite these gloomy prospects for the human race, which the population explosion does nothing to mitigate, Lorenz nevertheless avows his optimism. Certainly in throwing so much new light on the dark, instinctual layers of human nature, Lorenz has performed a signal service. Man's hope lies in knowledge and no branch of knowledge is as important for our survival as self-knowledge.

This is a book preferably to possess and ponder over. Failing that, beg or borrow it. C.S.

Population Studies of Birds by **David Lack.** Pp. 341 with 31 text figures and 50 tables. Clarendon Press: Oxford University Press. 1966. 63/-.

This work is a sequel to *The Natural Regulation of Animal Numbers* (1954), but whereas the earlier book dealt with theoretical principles illustrated by examples from various animals, the present one is a critical review of the work done in the last ten years on long term surveys of bird species. Thirteen major studies are reviewed: Great Tit, Coal Tit, Pied Flycatcher, European Blackbird, Tawny Owl, Quelea, Manakins, Wood Pigeon, Red Grouse and Ptarmigan, White Stork, Yellow-eyed Penguin, Kittiwake, and Mutton-birds and Manx Shearwater. These are treated in separate chapters with a useful concluding summary to each chapter. These chapters are followed by an appendix summarising the author's earlier book and outlining the controversies concerning the regulation of animal populations.

Dr. Lack's basic views on population regulation remain substantially those of the earlier book, namely that in birds it is controlled by density-dependent mortality which is ultimately controlled by food supplies. It is from this point of view that he presents and comments on the facts emerging from the various surveys, and the reader is privileged to see how these influences his thought and modify some of the details. These long term surveys cover a very wide range of bird types — the Tits are short-lived birds with high percentage annual population turnovers whilst the Penguins and Shearwaters are long-lived birds with small percentage turnovers. There are also tropical species, Manakins and Quelea as well as British species, thus providing a considerable variety of detailed data from which to draw generalised conclusions. One interesting point is that there appears indirect evidence that in some birds the onset of the breeding season is determined by the female obtaining enough food to form eggs. This is, of course, a principle well known to keepers of animals in captivity, and thus serves to emphasise the difficulty of obtaining precise information from ecological studies. It is also becoming apparent that in a number of species the major pruning of the population takes place immediately after the breeding season, before and not as a result of the onset of winter conditions, which only act as additional hazards. A truer estimate of breeding success might therefore be the number of young which survive to breed rather than the number of young which fledge.

It is extremely valuable to both the student of ornithology and of animal populations to have these long-term studies so conveniently collected together and commented upon by such an experienced worker as Dr. Lack. Though the specialists will find the book indispensable it also contains a great deal to interest all naturalists. The book is attractively produced with pleasant clear type and is enhanced by Robert Gillmor's enchanting line drawings. I.W.

Birds of Europe. Vols. I & II, Pp. 161, with 80 full-page colour plates in each from the lithographs of **John Gould.** Text by A. Rutgers. Methuen 1966. 35/– each volume.

Anyone picking up these volumes and expecting to find them a comprehensive guide to the birds of Europe will be disappointed. Those dealt with total 160 species including Pallas' Sand Grouse, Yellow-headed Wagtail, and Red-breasted Goose, but obviously with many absentees.

I was disappointed with the text, which runs to one page opposite each relative plate. The notes are not standardised in any way and are not free from grammatical errors. Occasionally the text is almost incomprehensible — 'They (Pratincoles) choose nesting sites in places where they can find plenty of food for their young which accounts for those that happen to breed in more northern parts'. Whether it was because the volumes were printed in Holland or whether the text was insufficiently checked, there is no excuse for presenting the public with: 'sitting on a fense of (or) a pole'; 'until the bird or fourth year'; 'moving with a scythe'; 'lemmings are plentyful' etc.

The information is not infrequently misleading. 'Kestrels which breed in Europe winter in Africa'; Black-necked grebe 'breeds in England, Wales, Ireland and parts of Scotland'; the Blackcap 'is mainly a summer visitor to Britain where it breeds locally in eastern Scotland and also in Ireland'.

In fairness it must be said that the second volume is distinctly better than the first in this respect and one hopes that future volumes which are to cover Gould's other illustrated books on birds of Asia, Australia, America and New Guinea will show further improvement.

But of course it is not really for the text that one would buy the present volumes. How heartily we must agree with the claim that 'Gould's plates have stood the test of time and . . . must still be numbered among the masterpieces of ornithological art'. They are excellently reproduced here, and it will be a real joy to have them available again for those who regard the bird not so much statistically but rather as a thing of beauty. R.F.D.

A Field Guide to the Birds of New Zealand and Outlying Islands by **R. A. Falla, R. B. Sibson,** and **E. G. Turbott.** Pp. 254, with 18 plates (6 in colour) and numerous text figures by Chloe Talbot Kelly. Collins. 36/–.

Modern methods of transport have made the world a much 'smaller' place and improvements yet to come will surely mean that visits from this country to New Zealand will be made by increasing numbers of people, including naturalists. This new field guide will be welcomed by bird watchers in New Zealand and perhaps no less by ornithologists in this country.

Anyone idly glancing through the book, and in the habit of so many people beginning at the back, will be surprised to find that the last plate depicts such birds as Yellowhammer, Redpoll, Chaffinch, Goldfinch and Hedge Sparrow. These, together with 23 other species have all been introduced into the islands, mainly about the 1860's and now the Blackbird and Song Thrush are among the commonest birds to be seen in the more open countryside. It is fascinating to find how many birds familiar to bird watchers here also occur at the opposite side of the world, though as is to be expected they are all birds which are long distance travellers such as petrels, skuas, terns and waders.

It is among the passerines, and the penguins, prions and parrots that the main differences between the two avifaunas occur, and among the wattle-birds, not represented in Britain, the endemic Maori names such as Huia and Kakako are unfamiliar to our ears.

The pattern of the book follows, to a degree, that of the famous Peterson Guides. Each species is dealt with in paragraphs on description, voice habitat and range, with breeding as an additional heading.

The authors shared responsibility, each covering a range of species — Dr. Falla the penguins, albatrosses, petrels, shags and gills; G. Turbott the kiwis, ducks, pigeons, parrots, owls, kingfisher and native passerines; while R. B. Sibson covered the remaining families and all introduced species. They admit that there are many gaps in their knowledge to date, and the book will provide a challenge to New Zealand bird watchers to make the next edition even more complete. The illustrations are clear and well produced. A.J.W.

Collins Pocket Guide to British Birds by **R. S. R. Fitter** and **R. A. Richardson.** (Revised edition). Pp. 287 + 112 plates. Collins 1966. 30/–.

In the fourteen years since it first appeared, this has become a well tried favourite. Designed primarily for the beginner it concentrates on the business of getting birds correctly identified. Family order is abandoned in favour of arranging birds of similar appearance together. Under the three main headings, land, water-side and water birds, they are dealt with according to size, general colouring and main field characters. As a result a single species may occur in four or five different groupings and in an equal number of plates. It has been a refreshingly bold approach which has paid off. Despite one or two less satisfactory illustrations (I was not happy about the skuas in plate 63), they are in general excellent and do not merely depict birds in breeding plumage.

No school or public library should be without a copy and there is no better book to put in the hands of the beginner. The revised 1966 edition has been enlarged to include up-to-date information on changes in status and some eleven additional species are illustrated. R.F.D.

The Shell Bird Book by **James Fisher.** Pp. 344 with 20 colour plates, numerous black and white illustrations and 9 maps. Ebury Press and Michael Joseph, 1966. 25/–.

The Shell bird sanctuary series of advertisements is well known. In this latest product of the campaign the author has been given a completely free hand and the only reference to the petroleum company is in the title of the book. The introduction calls the book 'a new soup with some old stock', and this is precisely what it is — a digest of old and new ornithological material, with some original contributions from the author.

The opening chapters deal with the evolution and history of the British bird fauna from lower cretaceous times, and the development of names and systematics. In the long chapter on the peculiarity of British birds the author discusses the bird fauna of these islands in relation to that of the rest of the world. Tantalising hints dropped about the breeding status of some rare species do nothing to allay the wild rumours which exist in ornithological circles, and focus is brought to bear on the work of bodies such as the B.T.O. and R.S.P.B., and the census and protection of some of these birds.

No documented evidence could support the assertion that the Black Redstart breeds in Yorkshire, but the spread of species such as the Avocet and Collared Dove, and the decline of Peregrine, Wryneck, and Red-Backed Shrike are well-known facts.

Various aspects of migration and of observatories and their work are explored, as is the development of bird protection in this country. It was, perhaps, a little parochial to have expected to find the name Ralph Chislett in the section listing personalities past and present in the ornithological world, but not, I think, unreasonable.

The closing chapters list all localities associated with birds, reserves, observatories, museums etc., county by county, and there is a fairly comprehensive bibliography of regional ornithological publications. A list of British birds and their status appears at the end.

The fine typography is accompanied throughout by numerous black and white illustrations, many being classics by such masters as Yarrell and Thomas Bewick. The lovely vignettes by Eric Ennion form the backbone of the now familiar Shell guide colour plates. As a contrast to the ubiquitous tiger and the getaway people, James Fisher, with the sponsorship of Shell, has produced something very wholesome that should appeal to those whose sympathies lie with the countryside. M.D.

Their Flight Shall Continue by **Joan Hicks.** Pp. 90; 16 black and white photographs. Phoenix. 16/–.

This unpretentious little book, quite openly described as being for bird lovers, contains numerous accounts of how ailing birds have been nursed and the treatments described could undoubtedly be of value to anyone with the time, inclination and space to put them into practice.

The sentimental and anthropomorphic approach to the subject is likely to make ornithologists wince at times but is hard to criticise when it is so well meant. Brief hints on budgerigar management are given but the author is no believer in cages except as a necessary part of the rehabilitation of injured wild birds. A.H.B.L.

Nematodes, by **H. D. Crofton.** Pp. 160. Hutchinson & Co. Ltd., London 1966. 13/6.

The Nematoda as a group have been somewhat neglected by zoologists and until relatively recently attention has been directed mainly at parasitic species of economic importance. The present book gives a balanced account of these interesting pseudocoelomate animals and equal consideration is given to both free-living and parasitic forms.

The survey of early work on nematodes is of particular interest and shows how in at least three instances discoveries of fundamental zoological importance were made during the late 19th century, though their significance was not immediately recognised. Butschli, working on *Ascaris*, published the first description of the formation of polar bodies during oogenisis; van Beneden, also with *Ascaris*, showed that the chromosomes of the zygote were derived in equal numbers from the nuclei of the egg and sperm; and Boveri, with *Parascaris*, showed that the fate of the cells in the embryo was determined during very early cleavage stages. This last discovery was to exert considerable influence, subsequently, on the development of experimental embryology,

The book examines in some detail the general organisation of the nematode, system by system, and includes recent experimental work on metabolic processes. The relationship between structure and function, seen so well in these animals, is ably demonstrated. There is a brief review of nematode life histories and of the major genera, and a useful outline classification is given. The bibliography is rather restricted, but does include reviews and texts, which in turn will serve as an introduction to nematode literature for the reader wishing to go deeper into the subject.

Well written, attractively produced, with clear original line drawings, and very reasonably priced, the book can be recommended without reservation to all students and teachers of invertebrate zoology, and to anyone interested in the less well known members of the animal kingdom. J.B.J.

Grass and Grassland by **Ian Moore.** Pp. xiv + 175 with 28 monochrome photographs and 5 text figures, *New Naturalist* series, Vol. 48. Collins. 28/-.

'Our life is so inextricably interwoven with that of the grasses which grace our fields that the study of grassland is both fascinating and intriguing to all who possess an inquiring mind . . .' The opening words of Dr. Moore's preface introduce the reader to a comprehensive study of the Gramineae in relation to man. Grasses make a major contribution to the agricultural output of the U.K. and as components of permanent and temporary grassland and rough grazings dominate the rural landscape. In vivid and lucid style Dr. Moore discusses the origin of grassland, its place in the seral succession and the historical development of the cultivated grass fields. Chapters devoted to the impact of science and economics on the many facets of grass production and utilization enable the layman to appreciate more fully the place of the grass field in the economy of both farm and nation.

Grass and Grassland is an excellent introductory study to the economic significance of the Gramineae and all will find this book a helpful guide to the complex inter-relationships which exist between man, his grazing animals and the grass sward. The photographs are of the high quality we associate with the *New Naturalist* series.
D.R.H.

The Atlantic Shore by **John Hay** and **Peter Farb.** Pp. 246. Harper and Row, 1966. 48/-.

Subtitled 'Human and Natural History from Long Island to Labrador' this book deals in a simple and readable way with the nature and life of a long and varied coastline. There are chapters on early exploration and exploitation, geology, the life of rocky and sandy shores, salt-marshes, animals of the sea, birds and, throughout, the effect of man. In particular the authors have regard to the way the land and sea have been exploited by man, as in the extinction of the great flightless auk and the decline of the Newfoundland sealing industry and they indicate the need for drastic conservation measures. John Hay is a poet and essayist while Peter Farb has written extensively on the natural history of North America. Their style of writing may sometimes be described as lyrical and though this may not appeal to everyone it is nevertheless very good of its kind. The book is well illustrated with pencil sketches by Edward and Marcia Norman. D.D.B.

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W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
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R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
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SOME PLANT RECORDS BY ROBERT TEESDALE

with special reference to the East Yorkshire flora.

EVA CRACKLES

In 1963, the Yorkshire Philosophical Society republished *A Catalogue of the more rare Plants which grow wild in the Neighbourhood of Castle Howard, in the North Riding of Yorkshire, disposed according to the Linnean System,* by Robert Teesdale (Rob, 1963, 20–31). This annotated list, which is of great importance as the first documented record of the flora of the North and East Ridings of Yorkshire, was presented to the Linnean Society in 1792 and later printed in the Society's Transactions (Teesdale, 1794, 103). Teesdale had at one time been head gardener to the Earl of Carlisle at Castle Howard and prepared the catalogue during this period, but presented it to the Linnean Society after he had removed to Ranelagh, Chelsea. The dates of the period during which Teesdale was gardener at Castle Howard have not been ascertained.

The republication was made possible by the kind permission of Mr. George Howard and the Linnean Society of London. Miss C. M. Rob, F.L.S., edited the republished work and added comments on the recent status of the species listed by Teesdale. Inevitably many species have been lost to the area since Teesdale's day, but it is nevertheless remarkable that a large number of them have survived the 'changes and chances' of so long a period. Through the kindness of Miss Rob I have received a copy of the Yorkshire Philosophical Society's republication of Teesdale's work. His list comprises 197 species, but it is with those records which have a bearing on the history of the East Riding flora that this article is concerned.

East Yorkshire Records

The species for which Teesdale gives localities which constitute certain or almost certain East Yorkshire records are few. It is assumed that 'at Kirkham' is most likely to mean to the east of the River Derwent and therefore in East Yorkshire, whereas 'near Kirkham' could signify either an East or North Riding record, but species so designated are included in this section. The species listed are given together with subsequent records for the area and the present status for each species in East Yorkshire. Throughout this paper the term 'uncommon' is used in the case of a species which has been recorded twelve times or less in the vice-county since 1930 and 'rare' for one recorded four times or less. Nomenclature throughout follows Dandy's *List of British Vascular Plants* (1958).

(1) KIRKHAM AND HOWSHAM

While residing at Castle Howard, Teesdale probably frequently visited the woods and marshes in the vicinity of Kirkham Abbey and Howsham. Very few of the species he saw there are given specific mention, but these are of great interest.

Equisetum hyemale — In some dry woods at Castle Howard and Kirkham, not common (Teesdale, 1794). By the side of the R. Derwent, three miles from Castle Howard (Baines, 1840, 128). Not recorded for v.c. 61 in Watson's *Topographical Botany* (1883). No record in Robinson's *Flora* (1902): nor in his *Addenda* (1903). One other East Yorkshire record is for Bubwith *c.* 1887 (Lees, 1941, 123). There are no recent records for the Castle Howard area and the plant has gone from a number of the stations given in Baker's *North Yorkshire* (Rob, 1963, 30).

Cardamine amara (Large Bitter-cress) — By the R. Derwent at Kirkham and in many other places (Teesdale, 1794). Frequent on the banks of the Derwent (Baines, 1840, 12). In old gravel pits in wet places, near the R. Derwent, Kirkham, M. B. Slater (Robinson, 1902, 66). Rare in E. Yorks.: the only other records are near Howden, J. Beanland (Robinson, 1902); Figham (Robinson, 1906); Burythorpe (*Nat.* 1958, 143).

Circaea alpina — In woods near Kirkham (Teesdale, 1794). This was certainly a misidentification; there is no known station for the species east of the Pennines.

Lathraea squamaria (Toothwort) — In the woods near Kirkham, at the foot of some rocks (Teesdale, 1794). Firby wood near Kirkham, M. B. Slater; wood near Kirkham Abbey (Baines, 1840, 80: Robinson, 1902, 157). No recent record for the Castle Howard area, but it could still be at Kirkham. Rare in E. Yorks.: two recent records, both in the Raywell area.

Adoxa moschatellina (Moschatel) — In many shady places near Kirkham (Teesdale, 1794). At Kirkham Abbey, M. B. Slater (Robinson, 1902, 118). Still at Kirkham, 1958 (Rob, 1963, 25); it is not clear whether it is now on the East Riding side of the Derwent. Rarely recorded for E. Yorks.: only other records are Boynton, 1910 and Heslington, 1882 (Lees, 1941, 55 and J. Payne, 1959).

Butomus umbellatus (Flowering Rush) — In the River Derwent at Howsham (Teesdale, 1794). At Kirkham (Baines, 1840, 108), quoted by Robinson (1902, 193). Still at Howsham, 1958 (Rob, 1963, 25). Several other E. Yorks. records, but now an uncommon plant.

Scirpus sylvaticus (Wood Club-rush) — Near the Abbey at Kirkham and in Prettywood, Castle Howard (Teesdale, 1794). Banks of the Ouse and Derwent (Baines, 1840, 111). Species not mentioned in Robinson's *Flora*. Given in *Addenda* to the *Flora* (Robinson, 1903, 100) on the authority of Watson's *Topographical Botany*. Found independently in Firby wood in 1910 by W. Ingham, comm. J. Payne and by J. F. Robinson (Lees, 1941, 111). Still at Kirkham (*Nat.*, 1958, 142) and at Castle Howard and Hovingham, N. Yorks., recorded *c.* 1950, C. M. Rob.

Our present knowledge of the Kirkham and Howsham areas is mainly based on a Y.N.U. excursion held there in 1958. The privately owned, well-wooded area which forms the Kirkham Abbey Estates has been comparatively rarely visited over the years and its flowering plants may well be under-recorded: this is likely to be particularly true of early or later flowering species.

(2) LANGTON and BIRDSALL

Teesdale visited the wolds in the vicinity of Langton and Birdsall and records two species specifically for this area and these are still known to grow there.

Astragalus danicus (Purple Milk-vetch, recorded as *A. arenarius*) — Upon the Wolds near Birdsall, and by the road from Malton to Setterington (Teesdale, 1794). Langton Wold (Baines, 1840, 30); this record being quoted in Robinson's *Flora*. Uncommon in E. Yorks.: still occurs on Langton Wold; also recently recorded near Bishop Wilton, at Cottondale, Sherburn, Duggleby High Barn, Brandesburton and Waterdale.

Asperula cynanchica (Squinancy Wort) — Upon Langton Wold (Teesdale, 1794). Not in Baines' *Flora*. In Watson's *Topographical Botany* (1883), as occurring in v.c. 61. Hedge banks on Langton Wold, M. B. Slater (Robinson, 1902, 118). Not recorded for any other E. Yorks. locality: still on Langton Wold.

Teesdale also records *Viola lutea* as occurring 'upon the Wolds' and says he had sometimes seen it with large purple flowers. No mention of this species is made in Robinson's *Flora* and no record for the Castle Howard district given in Baker's *North Yorkshire* (1863).

Astragalus danicus and *Asperula cynanchica* still survive on an ancient earthwork near Langton, together with *Hippocrepis comosa* (Horse-shoe Vetch). The wording of Teesdale's notes and a lack of records for *Hippocrepis comosa* suggest that Teesdale did not know the locality for these species which we now know and the indications are that both *Asperula cynanchica* and *Astragalus danicus* formerly occurred in more than one locality in the Langton area. In Teesdale's time Langton Wold was unenclosed grassland, which had not been ploughed for at least one hundred and fifty years (Harris, 1961).

(3) OTHER LOCALITIES

Dianthus deltoides (Maiden Pink) — About Scampston (Teesdale, 1794). Sandy ground in Scampton (*sic*) Park, between Malton and Scarborough (Baines, 1840, 18). No mention of the species in Robinson's *Flora* but included in the *Addenda* on the authority of Watson's *Topographical Botany*; also specimens had been sent to Robinson by W. H. St. Quintin, of Scampston Hall in 1902. This is apparently the same record as one given as 'Rillington, 1902, W. H. St. Quintin, J.F.R.' (Lees, 1941, 14) and erroneously attributed to the North Riding. The species was rediscovered near Scampston by Professor R. D'O. Good in 1956 (*Nat.*, 1957, 27) and is still there but reduced in quantity due to the planting and growth of conifers (E. Chicken and E. Crackles). All these records are believed to refer to the one locality and there is no other E. Yorks. record.

Campanula trachelium — In Heslerton Woods (Teesdale, 1794); doubtless recorded in error.

A summary of this information is given in the table opposite:

Species	*Teesdale* 1794	*Baines* 1840	*Robinson* 1902 & 1903	*Recent record Castle Howard Area: including Lees*	*E. Yorks. status* 1966
Equisetum hyemale	(61) Kirkham (62) Castle Howard	By Derwent; Riding not indicated	— —	— —	No recent record
Cardamine amara	(61) Kirkham	On Derwent	1902: Kirkham (M.B.S.)	(61) Burythorpe	rare
Viola lutea	'On wolds'	—	—	—	No other record
Dianthus deltoides	(61) Scampston	'Scampton'	1903: W. T. B. and Scampston (St. Quintin)	(61) Scampston (Lees, 1941: N. Yorks. in error)	No other record
Astragalus danicus	(61) Nr. Birdsall and Malton to Setterington	Langton Wold	1902: Langton Wold (B.)	(61) Langton	uncommon
Lathraea squamaria	(61) Near Kirkham	Kirkham	1902: Kirkham (B.)	—	rare
Asperula cynanchica	(61) Langton Wold	—	1902: Langton (M.B.S.)	(61) Langton, 1965 (E.C.)	rare
Adoxa moschatellina	Near Kirkham	—	1902: Kirkham (M.B.S.)	(?61, 62) Near Kirkham (Rob, 1963)	rare
Butomus umbellatus	(61) Howsham	Kirkham	1902: Kirkham (B.)	(61) Kirkham, 1958 (Rob)	uncommon
Scirpus sylvaticus	(61) Kirkham (62) Castle Howard	Banks of Derwent	1903: W.T.B.	(61) Kirkham (Lees, 1941) and 1958	rare

KEY: M.B.S.= M. B. Slater; W.T.B.=Watson's Topographical Botany; B.=Baines in *Flora* (1840).

Some Omissions from Robinson's 'Flora'

Some interesting facts come to light on examining the species for which Teesdale gave East Yorkshire localities in this paper and the subsequent records for these.

1. No records for *Equisetum hyemale, Dianthus deltoides, Viola lutea* and *Scirpus sylvaticus* are given in *The Flora of the East Riding of Yorkshire,* by J. F. Robinson (1902).
2. None of the other species are given in Robinson's *Flora,* as being recorded by Teesdale. *Cardamine amara* and *Asperula cynanchica* are given for the same locality as the one for which Teesdale recorded them, but are accredited to a later authority, Matthew B. Slater, F.L.S., of Old Malton, who supplied Robinson with a list of plants. Two other species are recorded for a locality near to that recorded by Teesdale in Baines' *The Flora of Yorkshire* (1840): *Butomus umbellatus* at Kirkham and *Astragalus danicus* on Langton Wold. Baines specifies neither the authority nor the date for the records he cites.
3. East Yorkshire records for the Kirkham area are given for both *Lathraea squamaria* and *Adoxa moschatellina* in Robinson's *Flora*: both of these species are given by Teesdale as occurring 'near Kirkham'.

Clearly Robinson, in preparing his *Flora* did not consult Teesdale's *Catalogue.* He knew of both papers which Teesdale presented to the Linnean Society; the paper under discussion being styled *Plantae Eboracenses* and the later one, presented in 1798, termed a *Supplement to Plantae Eboracenses* (Robinson, 1902, 11). Extracts from Teesdale's later paper are contained in a notebook of Robinson's in the possession of the Hull Museum. As Robinson's *Flora* contains a number of Teesdale's records, the omission of the East Yorkshire records in *Plantae Eboracenses* from the *Flora* was not the result of a deliberate decision to omit them because of the antiquity they had already acquired. A year after publication of his *Flora* Robinson published *Addenda to the Flora of the East Riding* (Robinson, 1903, 98–100), dealing with records completely omitted from his earlier work. In this, seventeen species were added to the East Yorkshire flora. Many of these additional records were old ones which had been overlooked. Arthur Bennett of Croydon had pointed out that nine species omitted from Robinson's *Flora* were cited for v.c. 61 in Watson's *Topographical Botany*: *Dianthus deltoides* and *Scirpus sylvaticus* were two of these. Robinson in compiling his East Yorkshire *Flora* relied on Baines' *Flora* (1840) and Baker's *Supplement to Baines Flora of Yorkshire* (1854). Both Baines and Baker in these works were recording for Yorkshire as a whole and were writing before the introduction of the vice-county system. Three species given by Teesdale as occurring at Kirkham or Howsham were described by Baines as occurring 'on the banks of the Derwent'. This led to Robinson's omission of *Scirpus sylvaticus* and *Equisetum hyemale.* The third species, *Cardamine amara* had been confirmed by this time, as occurring on the East Riding side of the River Derwent at Kirkham by Slater. The record for *Dianthus deltoides* had apparently been overlooked by Robinson, possibly as a result of a spelling error in the place name of the locality for this species as it appeared in Baines' *Flora.* Baines cited neither dates nor authorities, but he appears to have incorporated records from Teesdale's paper. He either overlooked or rejected records for *Viola lutea* and *Asperula cynanchica*: Teesdale's locality for the second of these was confirmed later by Slater before the publication of Robinson's *Flora.* Teesdale's locality for *Scirpus sylvaticus* was discovered independently later. Having regard to all the circumstances there seems to be at least a possibility that Teesdale's record for *Equisetum hyemale* 'at Kirkham' did in fact constitute an East Yorkshire record. Baker (1863) gives this species as occurring by the Derwent opposite Kirkham, i.e. in North Yorkshire, but this does not necessarily mean that the species had not occurred on the East Yorkshire side of the river also.

OTHER RECORDS

Many of the records in Teesdale's *Plantae Eboracenses* are for the vicinity of Castle Howard; some are for the area generally and some for specific localities a little further afield.

Some of these species are given below together with Teesdale's comment, also recent records for an area of ten miles radius from Castle Howard, as well as a comment on their status in both North and East Yorks. Only species which are now rare or uncommon in East Yorkshire are treated in this way. Species characteristic of habitats not represented in the East Yorkshire part of the area are omitted. Names used by Teesdale are given in brackets.

Plants, other than Arable Weeds

In the tables below, unc. = uncommon and r. = rare.

Name of species and Teesdale's comment	*Recent records Castle Howard area*	*Recent records N. Yorks.*	*E. Yorks. status 1966*
Asplenium adiantum-nigrum (Black Spleenwort) Common	—	Crags at Whitestonecliff. Rare (Rob, 1963, 31). Newtondale, G. Simpson, 1965	r.
Asplenium trichomanes (Maidenhair Spleenwort) Common	(61) Kirkham (*Nat.*, 1958, 142)	Common in many places, particularly in limestone dales; C. M. Rob	unc.
Asplenium ruta-muraria (Wall-rue) Common	(61) Kirkham (*Nat.*, 1958, 142)	Still plentiful on old walls (Rob, 1963, 31)	unc.
Polystichum aculeatum (*Polypodium aculeatum*) (Hard Shield-fern) Common, in woods	—	Recorded for several squares in *Atlas*	unc.
Thelypteris oreopteris (*Polypodium oreopteris*) (Mountain Fern) In woods at Castle Howard	—	Plentiful in many places to the north; C. M. Rob	r.
Thelypteris phegopteris (*Polypodium phegopteris*) (Beech Fern) In stone quarry at Castle Howard (and in woods at Hornby and Helmsley, Teesdale ms.)	—	In woods in hills to north (Rob, 1963, 31)	One record
Polypodium vulgare (Polypody) In woods, common	(62) Barton Heights Wood; C. M. Rob	Still common in woods (Rob, 1963, 31)	unc.
Botrychium lunaria (*Osmunda lunaria*) (Moonwort) Two locations at Castle Howard	(61) Kirkham, 1958 (Rob, 1963, 30)	Recorded for nine 10 km. squares in *Atlas*	r.
Ophioglossum vulgatum (Adder's Tongue) In some meadows at Castle Howard, rare	(61) Birdsall, 1956; Lady Middleton	Recorded for eight 10 km. squares in *Atlas*	unc.
Trollius europaeus (Globe Flower) Hovingham Woods	—	Recorded for two 10 km. squares in *Atlas*	No record
Helleborus viridis (Green Hellebore) In hedges near Stonegrave, scarce	—	Recorded as 'probably native' for three 10 km. squares in *Atlas*	unc.
Actaea spicata (Baneberry) At Hildersley (?Hildenley) and Hovingham lanes	(62) Hovingham, 1956; P. M. Garnett: Cauklass, 1965; W. A. Sledge (61) Kirkham, 1964; E.C.	unc.	unc.

Name of species and Teesdale's comment	*Recent records Castle Howard area*	*Recent records North Yorks.*	*E. Yorks. status 1966*
Hypericum montanum (Mountain St. John's Wort) In woods at Castle Howard	—	Still occurs in a number of places on limestone; C. M. Rob	No recent record
Stellaria nemorum (Wood Stitchwort) By rivulets and in shady moist woods	(61) Howsham Wood (*Nat.*, 1958, 142)	Recorded for two 10 km. squares in *Atlas*	r.
Minuartia hybrida (*Arenaria tenuifolia*) (Fine-leaved Sandwort) Upon Barton Heights, near Castle Howard	No record since this one of Teesdale's; C. M. Rob	—	No recent record
Linum anglicum (Perennial Flax) In Bulmer fields, near Castle Howard	(61) Near Duggleby (E.C.)	—	r.
Vicia sylvatica (Wood Vetch) Slingsby Wood and Coneysthorpe Banks, near Castle Howard	(61) Kirkham Abbey; E. J. Payne, 1938 (62) May still be in the Castle Howard area Rob, 1963, 27)	Not uncommon in several dales to the north and locally on the coast; C. M. Rob	r.
Rubus saxatilis (Stone Bramble) In stony woods, rare	—	In many valleys in limestone hills to the north (Rob, 1963, 26)	No record
Potentilla tabernaemontani (*Potentilla verna*) (Spring Cinquefoil) In rocky woods at Castle Howard and Hovingham	—	Near Hawnby; P. M. Garnett (*Nat.*, 1966, 23)	No record
Chrysosplenium oppositifolium (Opposite-leaved Golden Saxifrage) In Mowthorpe Dale and in moist shady lanes and woods	(61) Howsham Woods (*Nat.*, 1958, 142) Acklam, 1961; E.C.: Leppington, 1955; R. Good; Wharram, 1957; E.C. (62) Norton, 1957; T. Medd	Not uncommon in woods from west escarpment to Forge valley (Rob, 1963, 25)	unc.
Chrysosplenium alternifolium (Alternate-leaved Golden Saxifrage) Near Hornby (?Hawnby), but very rare	—	Still grows in a number of places	No record
Apium inundatum (*Sison inundatum*) In watery places, not uncommon	(62) Sutton-on-Forest; C. M. Rob	Rare as a result of drainage (Rob, 1963, 24)	unc.
Polygonum bistorta (Bistort) In moist meadows	—	Not uncommon in suitable habitats; C. M. Rob	unc.

Name of species and Teesdale's comment	*Recent records Castle Howard area*	*Recent records North Yorks.*	*E. Yorks. status 1966*
Cynoglossum officinale (Hound's-tongue) Near Mowthorpe Dale	—	Recorded for seven 10 km. squares in *Atlas*	r.
Lithospermum officinale (Gromwell) In stony woods at Castle Howard	(61) Kirkham (*Nat.*, 1958, 143) (62) Hovingham, Nunnington (Rob, 1963, 23)	In four 10 km. squares in *Atlas*	unc.
Gnaphalium sylvaticum (Wood Cudweed) In various places	(62) In several places near Coneysthorpe and Castle Howard (Rob, 1963, 28)	Recorded for five 10 km. squares in *Atlas*	unc.
Crepis paludosa (*Hieracium paludosum*) (Marsh Hawk's-beard) In woods at Castle Howard	(61) Crambeck and Howsham Wood, (*Nat.*, 1958, 142); Jeffrey Bog, 1958; R. Good	Recorded for eight 10 km. squares in *Atlas*	unc.
Paris quadrifolia (Herb Paris) In moist shady woods	(61) Burythorpe (*Nat.*, 1964, 29)	Plentiful in woods to the north (Rob, 1963, 25)	unc.
Allium scorodoprasum (*A. arenarium*) (Sand Leek) In meadows at Castle Howard, very scarce	—	Not uncommon in Vale of York (Rob, 1963, 24)	unc.
Allium oleraceum (Field Garlic) In ploughed fields near Hovingham Moor	—	Fairly frequent in many places in Vale of York and lower dales; C. M. Rob	r.
Epipactis helleborine (*Serapias latifolia*) (Broad-leaved Helleborine) In Raywood and in bogs at bottom of Prettywood at Castle Howard	—	Recorded for several 10 km. squares in *Atlas*	unc.
Spiranthes spiralis (*Ophrys spiralis*) (Autumn Lady's Tresses) In dry pastures at Whitwell, but scarce	—	rare	One very old record
Neottia nidus-avis (*Ophrys nidus-avis*) (Bird's-nest Orchid) In Coneysthorpe Banks, near Castle Howard	—	No. of localities along limestone hills (Rob, 1963, 29)	No recent record
Coeloglossum viride (*Satyrium viride*) (Frog Orchid) In dry meadows and pastures, rare	Recorded for Terrington and Kirkham 10 km. squares (Rob, 1963, 29)	Recorded for several 10 km. squares in *Atlas*	unc.
Platanthera bifolia (*Orchis bifolia*) (Lesser Butterfly Orchid) In woods and meadows at Castle Howard	—	Recorded for three 10 km. squares in *Atlas*	No recent record

Name of species and Teesdale's comment	*Recent records Castle Howard area*	*Recent records North Yorks.*	*E. Yorks. status* 1966
Orchis ustulata (Burnt-tip Orchid) In dry stony meadows about Castle Howard	—	Recorded for two 10 km. squares in *Atlas*. Decreasing (Rob, 1963, 29)	rare now
Orchis morio (Green-winged Orchid) In woods and meadows at Castle Howard	—	Becoming increasingly rare(Rob, 1963, 28)	unc. now
? *Carex binervis* rec. as *C. distans* (Ribbed Sedge) In neighbourhood of Castle Howard	—	In several 10 km. squares in *Atlas*	unc.
Carex vesicaria (Bladder Sedge) In various places, not uncommon	Recorded for three 10 km. squares in *Atlas*	Recorded for four 10 km. squares in *Atlas*	unc.
Carex pallescens (Pale Sedge) In neighbourhood of Castle Howard	(61) Kirkham (*Nat.*, 1958, 143)	Recorded for nine 10 km. squares in *Atlas*	r.
Carex pilulifera (Pill-headed Sedge) In neighbourhood of Castle Howard	(61) Kirkham (*Nat.*, 1958, 143): Kennythorpe, 1958, E.C.	In several 10 km. squares in *Atlas*	unc.
Carex paniculata (Panicled Sedge) In neighbourhood of Castle Howard	(61) Burythorpe (*Nat.*, 1958, 142) (62) Castle Howard, 1950; C. M. Rob	Recorded for three 10 km. squares in *Atlas*	unc.
Poa compressa (Flattened Poa) Upon old walls at Castle Howard, but not common	(61) Kirkham Abbey (*Nat.*, 1958, 142): Rillington, 1958, E.C. (62) Terrington, 1955 and Coneysthorpe, 1938; C. M. Rob	Recorded in several 10 km. squares in *Atlas*	unc.
Hordelymus europaeus (*Hordeum sylvaticum*) (Wood Barley) In woods at Castle Howard	—	Not uncommon in woods in some areas (Rob, 1963, 22)	No record
Milium effusum (Wood Millet) In woods at Castle Howard, but rare	No recent record: may still be there (Rob, 1963, 22)	In Forge Valley and near Helmsley (Rob, 1963, 22)	unc.

Other old records for some of the above species for the 'Castle Howard District', E. Yorks. sector, are of interest:— *Thelypteris phegopteris* — one record for E. Yorks., no locality given (Robinson, 1903); *Minuartia hybrida* — in a field, near Kirkham Abbey (Baines, 1840, 20 and Robinson, 1902, 177), the authority for this record is Dalton (Baker, 1854, 52); *Neottia nidus-avis* — wood, near Kirkham Abbey, M. B. Slater (Robinson, 1902, 180); *Orchis ustulata* — Kennythorpe, M. B. Slater (Robinson, 1902, 182).

Teesdale also recorded the following species which call for comment:— *Polypodium cristatum* — in woods, common. If the plant now known as *Dryopteris cristata* is meant, this is 'a very unlikely record' (Rob, 1963, 31). The species has occurred in the area: there is an old record for Kennythorpe Moor by M. B. Slater (Robinson, 1902), but the record has never been confirmed. *Potentilla argentea* — in rocky woods at Castle Howard and Hovingham. This record is not cited by Baker (1863) and is thought to have been an error since this species characteristically grows in dry places fully exposed to the sun (Rob, 1963, 26).

Serapias longifolia — in a wood called Cum Hag at Castle Howard, rare. This was taken by Baker (1863) to refer to the rare Narrow-leaved Helleborine (*Cephalanthera longifolia*), but the name has also been used as a synonym for Marsh Helleborine (*Epipactis palustris*). *Satyrium fuscum* — in dry meadows, rare. It is not known what species is meant.

Also included in Teesdale's *Catalogue* are *Alchemilla minor*, *Orchis maculata*, *Orchis latifolia*, *Carex flava* and *Carex muricata*. These are all names which have been used for aggregates of two or more species. *Alchemilla glabra*, *A. vestita* and *A. xanthochlora* have all been recorded for the 'Castle Howard area' (Rob, 1963, 23); *A. vestita* for a field near Howsham Wood (V.C. 61), 1956 by E.C., and at Norton (V.C. 62), by T. F. Medd, as well as at Coneysthorpe and Baxenhowe (V.C. 62), 1950 by C. M. Rob: and *A. xanthochlora* for Kirkham Abbey woods (V.C. 61), 1958, by R. Good and at Gilling (V.C. 62) by C. M. Rob. No Marsh Orchid has been noted in the East Riding part of the area. Of the *Carex flava* group of species, *C. lepidocarpa* was recorded for Howsham in 1958 (*Nat.*, 1958, 142) and of the *Carex muricata* group, the rare *C. divulsa* was recorded for Cum Hag Wood by H. Ibbotson (Baker, 1854, 131) and was subsequently recorded for the E. Yorks. part of the area at Kirkham (*Nat.*, 1958, 142) where it still occurs. *C. muricata sens. str.* was noted at Terrington Coomb about 1955 by C. M. Rob and the more common *C. spicata* also occurs as at Kirkham. Teesdale also recorded *Hieracium umbellatum* and *H. subaudum* for Castle Howard: no recent work has been done on the *Hieracia* of the district.

Weeds of Arable Fields and Aliens: Malton Area

Teesdale recorded a number of interesting species from arable fields near Malton, including several aliens, some of which have only rarely been recorded for Yorkshire. These are listed in the table following. It is impossible to tell whether the records apply to the North or East Yorkshire parts of the area.

Malton cornfields	*Recent records E. Yorks. part of Castle Howard district*	*Recent records N. Yorks.*	*E. Yorks. status* 1966
Papaver hybridum (Round Prickly-headed Poppy)	—	Now a rare casual; C. M. Rob	Casual, no recent record
Papaver argemone (Long Prickly-headed Poppy)	Wharram (*Nat.*, 1959, 132); Leavening (*Nat.*, 1958, 143)	Still occurs, less common than formerly (Rob, 1963, 26)	Rare casual
Malva moschata (Musk Mallow)	West Lutton, 1 plant, 1964, E.C.	Not uncommon in some areas; C. M. Rob	Uncommon
Malva alcea By hedges	—	—	No record
Bupleurum rotundifolium (Hare's Ear)	—	Once not uncommon; not seen for many years (Rob, 1963, 24)	No recent record
Legousia hybrida (*Campanula hybrida*) (Venus's Looking-glass)	Langton, locally frequent, E.C.	Still occurs in calcareous arable fields in Hovingham — Cauklass district (Rob, 1963, 23)	Uncommon
Galium spurium (False Cleavers)	—	Casual	Rare
Lolium temulentum (Darnel)	—	Casual now (Rob, 1963, 22)	Rare casual

Galeopsis tetrahit was said to be frequent amongst the corn and is still one of the more widespread of the cornfield weeds. *Bromus arvensis* was also given for Malton cornfields. *Bromus arvensis* is a very uncommon alien and it is possible that any of the three species *B. mollis*, *B. thominii* or *B. lepidus* were meant. All have been recorded for the Langton area in recent years. Another species found persistently in arable fields in the Langton area recently and not recorded by Teesdale is *Geranium columbinum* (Long-stalked Cranesbill).

Records for Malton Fields

Species listed by Teesdale for 'Malton fields' may refer to the specific area marked on the maps as 'Old Malton Fields' which is in the North Riding part of the Malton area or may refer to any fields in the Malton area and so constitute either North or East Riding records. These are *Ranunculus parviflorus* (Small-flowered Buttercup), *Geranium sanguineum* (Bloody Cranesbill), *Lathyrus aphaca* (Yellow Vetchling), *Torilis nodosa* (Knotted Hedge-parsley), *Caucalis leptophylla* and *Orobanche major*. *Ranunculus parviflorus*, which is rare in E. Yorks., has in recent years been seen near North Grimston, first seen in 1950 by C. M. Rob and K. Payne. *Geranium sanguineum*, which is uncommon in E. Yorks. was found at Birdsall (*Nat.*, 1959, 132). *Torilis nodosa* occurs in both North and East Riding parts of the area in fields on calcareous soil. *Lathyrus aphaca* and *Caucalis leptophylla* are rare casuals and the only E. Yorks. records are for Hull docks (Wilson, 1938, 12 and Lees, 1941, 54).

Then and Now

1. Many of the species recorded by Teesdale for the 'Castle Howard district' still exist within a ten mile radius of Castle Howard, some in the same location which Teesdale knew.

2. Other species may still be present and have gone unrecorded.

3. Most of the types of habitat in which Teesdale found the species under discussion are still represented, although some are now much less extensive.

4. Coniferous woodland now replaces some of the deciduous woodland and on the East Yorkshire side there has been extensive felling in the Howsham Wood area.

5. Some species have apparently become extinct, notably *Equisetum hyemale*, *Potentilla tabernaemontani* and *Spiranthes spiralis*.

6. Other species have decreased markedly in their distribution since Teesdale's day, some as a result of felling, some as a result of drainage, e.g. *Apium inundatum*, and some, e.g. *Orchis morio* and *O. ustulata* as a result of changed agricultural procedure and more extensive ploughing, as pointed out by Miss Rob (1963). There has been a particularly great reduction of chalk grassland since Teesdale's day when Langton Wold was unenclosed grassland.

8. Some weeds of arable land, which may not have been uncommon in Teesdale's day have now disappeared, notably *Bupleurum rotundifolium*, or become very rare, e.g. *Lolium temulentum* and *Papaver argemone*.

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LICHENS COLLECTED BY JONATHAN SALT BETWEEN 1795 AND 1807 NOW IN THE HERBARIUM OF SHEFFIELD MUSEUM

D. L. HAWKSWORTH

Department of Botany, University of Leicester

While examining specimens in the herbarium of Sheffield City Museum in April, 1966, I came across a collection of 83 undetermined lichens some of which were mounted on card while others were still in sheets of drying paper. This collection is almost certainly that of Jonathan Salt, F.L.S., as 'Mr. Salt' appears on one of the drying sheets and the handwriting on the mounted specimens is identical with that on a collection of flowering plants known to have been Salt's. Salt was an amateur botanist and a close friend of J. Sowerby, illustrator of *English Botany*, a number of whose specimens are included in the collection. A catalogue of Salt's flowering plants was prepared by Howarth, then Curator of Sheffield Museum, and this was later published by the Sheffield Literary and Philosophical Society in 1889.

Almost all the specimens were collected in the neighbourhood of Sheffield apart from three collected 'on the continent' between 1786 and 1787 which were presented to Salt by Dr. Younge in about 1802 (Howarth, 1889) and seven from Sowerby. Salt's specimens are not cited by Turner and Dillwyn (1805) although they appear to have had a common friend with Salt, a Dr. Smith (possibly Sir J. E. Smith whose Derbyshire lichen records are listed in Leighton, 1879). The collection was not seen by Dr. W. Watson and includes some species additional to his list of Yorkshire lichens (Watson, 1946) and to his *Census Catalogue of British Lichens* (1953). Of particular interest are the specimens from Derbyshire (a county which has received little attention from lichenologists in the past) which include *Alectoria fuscescens, Ramalina fraxinea* and species of *Umbilicaria* and *Usnea* now thought to be extinct in the county.

The species are arranged in alphabetical order and the nomenclature follows James (1965). Species which are additional to Watson (1953) are preceded by an asterisk (*) and Salt's names and localities, where these are known, appear in inverted commas.

Alectoria fuscescens Gyeln. 'Lichen jubatus; from rocks on the high moors about 7 miles South West of Sheffield near the 7 mile stone, Grindleford Bridge Road.'

Alectoria fuscescens Gyeln. 'On the rocks by the side of the rivulet on the left-hand side just before the entrance into the cave at Castleton, Derbyshire.'

Alectoria fuscescens Gyeln. 'Alectoria Jubatus (Lichen Jubatus); from a rock on the high moors about 6 miles south-west of Sheffield — July, 1799.'

Alectoria pubescens (L.) R. H. Howe. 'Lichen exilis.'

**Alectoria pubescens* (L.) R. H. Howe. 'On rocks on the high moors near Bradfield.' This species is not listed by Watson from South-West Yorkshire.

Anaptychia ciliaris (L.) Körb. 'Borrea ciliaris; trunk of a tree between Cadeby and Sprotboro — Doncaster.'

Arthonia radiata (Pers.) Ach. 'Lichen rugosus.'

Calicium abietinum Pers.

**Cetraria islandica* (L.) Ach. 'Cetraria islandica (Lichen islandica). Gathered on the high moors near Fullwood.' Not listed by Watson from either Derbyshire or South-West Yorkshire.

Cetraria nivalis (L.) Ach. 'Cerania nivalis, Lin. Labradore.'

Cladonia furcata (Huds.) Schrad. 'Cladonia furcata var. spinosus, Lichen spinosus? High moors 6 miles south-west of Sheffield.'

Cladonia gracilis (L.) Willd. 'Scyphophorus gracilis (Lichen gracilis).'

Cladonia gracilis (L.) Willd. Packet with 'Mr. Salt' written on it.

Cladonia impexa Harm. 'Lichen rangiferinus.'

Cladonia pityrea (Flörke) Fr. 'Scyphophorus sparassus.'

Cladonia rangiferina (L.) Web. 'Cladonia rangiferina.'

Cladonia uncialis (L.) Web. 'Cladonia uncialis, Lichen uncialis.'

**Collema auriculatum* Hoffm. 'Lichen, from Cavedale, Castleton, Derbyshire.' Not listed by Watson from Derbyshire.

**Collema multipartitum* Sm. 'Collema multipartitum (Lichen marginalis); from a rock on Cadeby Common near Conisbro' Castle.' Not listed by Watson from South-West Yorkshire.

Cornicularia aculeata (Schreb.) Ach. '(Lichen hispidus) Cornicularia aculeata.'

Cornicularia normoerica (Gunn.) Du Rietz. '(Lichen tristis) Cornicularia tristis; From Mr. Sowerby.'

Dermatocarpon miniatum (L.) Mann. 'Endocarpon miniatum.'

Dermatocarpon miniatum (L.) Mann. 'Endocarpon miniatum (Lichen miniatum); Cadeby Common near Conisbro' Castle, Jany. 1798.'

Diploschistes scruposus (Schreb.) Norm. 'Urceolaria scruposa (Lichen scruposus).'

Evernia prunastri (L.) Ach. 'Evernia prunastri (Lichen prunastri); from a tree in Padley Wood near Grindleford Bridge, Derbyshire. July, 1799.'

Lecanora chlarotera Nyl. 'Lecanora subfusca.' 2 specimens.

Leptogium burgessii (L.) Mont. 'Collema burgessii (Lichen burgessii); From Mr. Sowerby, London.'

Lobaria laetevirens (Lightf.) Zahlbr. 'Lin. glomuliferus.'

Lobaria laetevirens (Lightf.) Zahlbr. 'Lichen late — virens, Parmelia herbaceae.'

Mycoblastus sanguinarius (L.) Norm. 'Lecidea sanguinea (Lichen sanguinarius).'

Nemphromium lusitanicum (Schaer.) Nyl. 'Nemphroma resupinata (Lichen resupinatus); From Mr. Sowerby.'

Ochrolechia pallescens (L.) Massal. 'Lecanora parella (Lichen parella).'

Opegrapha rimalis Pers. 'Opegrapha rimalis.'

Parmelia caperata (L.) Ach. 'Parmelia caperata (Lichen caperatus); 1–3 From the continent 1786–7, Dr. Younge; 4 From Cornwall, Mr. Sowerby.'

Parmelia conspersa (Ehrh. ex Ach.) Ach. 'Parmelia conospersa (Lichen conopersa centrifugus Withg.); From the continent 1786–7, Dr. Younge.'

Parmelia delisei (Duby) Nyl. 'Parmelia olivacea (Lichen olivaceus).'

Parmelia furfuraceae (L.) Ach. 'Borrera furfuraceae (Lichen furfuraceae).'

Parmelia physodes (L.) Ach. 'Parmelia physodes; From an old wall near Warncliffe Lodge, Augst. 1800. Salt.'

Parmelia quercina (Willd.) Vain. 'Parmelia tiliaceus (Lichen tiliaceus).'

Parmelia omphalodes (L.) Ach. 'Parmelia omphalodes (Lichen omphalodes); from a rock on the high moors about 7 miles south-west of Sheffield.'

Parmelia saxatilis (L.) Ach. 'Parmelia saxatilis (Lichen saxatilis); from a rock near Birling Corn-Mill.' In fruit.

Parmeliella plumbea (Lightf.) Vain. 'Lichen plumbieus, Placodium plumbeum; From Mr. Sowerby, London.'

Peltigera canina (L.) Willd. 'Lichen caninus.'

Peltigera polydactyla (Neck.) Hoffm. 'Lin. rufus?'

Peltigera venosa (L.) Baumg. 'Peltidia venosa (Lichen venosus).'

Pertusaria amara (Ach.) Nyl. 'Ariolaria faginea.'

Pertusaria pertusa (L.) Tuck. 'Pertusaria communi (Lichen pertusus).'

Physcia stellaris (L.) Nyl. em. Harm.

Physcia tenella (Scop.) DC. em. Bitt. 'Borrera tenella (Lichen tenellus).'

Ramalina cuspidata (Ach.) Nyl. 'Lichen calcicaris?'

Ramalina siliquosa (Huds.) A.L.Sm. 'Ramalina scopulorum (Lichen scopulorum); From Mr. Sowerby, London.'

Ramalina farinacea (L.) Ach. 'Lichen farinaceus, Ramalina farinacea.'

Ramalina fraxinea (L.) Ach. (as the monstrose forma *ampliata* (Ach.) Anders). 'Ramalina fraxinea (Lichen fraxineus); from a tree near Grindleford Bridge, Derbyshire — June, 1803.'

Rocella fuciformis DC. 'Rocella fuciformis (Lichen fuciformis); from Mr. Sowerby.'

Rocella phycopsis (Ach.) Ach. 'Rocella tinctoria (Lichen rocella).'

**Solenospora candicans* (Dicks.) Steiner. 'Squamarina saxicola; Cadeby Common, near Connisbro' Castle, Yorkshire.' Not listed by Watson from South-West Yorkshire.

Solorina saccata (L.) Ach. 'Solorina saccata (Lichen saccatus); gathered in Cave — Dale, Castleton, Derbyshire. June 1, 1801.'

Sphaerophorus globosus (Huds.) Vain. 'Sphaerophorus coralloides (Lichen globiferus); gathered on a large stone in Stannington Wood, near Cliffe Rocker. 1799.'

Squamerina lentigera (Web.) Poelt. 'Squamerina lentigera, Lichen lentigerus.'

Stereocaulon dactylophyllum Flörke. 'Stereocaulon paschale (Lichen paschalis).'

Thamnolia vermicularis var. *subuliformis* (Ehrh.) Schaer. 'Cladonia vermicularis (L. vermicularis).'

Toninia coeruleonigricans (Lightf.) Th.Fr. 'Psora caeruleo-nigricans.'

Umbilicaria cylindrica (L.) Del. ex Duby. 'Gyrophora cylindrica (Lichen proboscidens).'

Umbilicaria deusta (L.) Baumg. 'Gyrophora polyphylla.'

**Umbilicaria polyphylla* (L.) Baumg. 'Gyrophora polyphylla (Lichen polyphylla); from a rock on the high moors about 7 miles south-west of Sheffield. July, 1799.' Although this is not listed for Derbyshire by Watson it is by Kershaw (1961).

Umbilicaria polyrrhiza (L.) Fr. 'Gyrophora pellita (Lichen polyrhizos).'

Umbilicaria proboscidea (L.) Schrad. 'Gyrophora deusta (Lichen denotus).'

Umbilicaria torrefacta (Lightf.) Schrad. 'Gyrophora erosa (Lichen pustulatus); from a rock on the high moors about 7 miles south-west of Sheffield. July, 1799.'

Usnea articulata (L.) Hoffm. 'Usnea barbata var. articulata (Lichen articulatus); Dr. Younge.'

**Usnea ceratina* Ach. 'Usnea plicata (Lichen plicatus); from the trunk of a tree near Warncliffe Lodge. Augst. 1800.' Not listed by Watson from Yorkshire.

Usnea subfloridana Stirt. 'Usnea hirta.'

**Usnea florida* (L.) Web. 'Usnea florida (Lichen floridus); found on a fir-tree in Padley Wood near Grindleford Bridge, Derbyshire. July, 1799.' Not listed by Watson for Derbyshire although the manuscript of Rev. N. Hubbersty (of Wirksworth) in Derby Museum records 'Lichen floridus . . . betwixt Derby and Coxbench'. The date of this manuscript is uncertain but is most probably c. 1800.

Usnea glabrescens (Nyl. ex. Vain.) Vain. 'Lichen hirtus, Usnea plicata var. hirta.'

Usnea rubiginea (Michaux) Massal. 'Usnea plicata var. hirta.'

Xanthoria parietina (L.) Th.Fr. 'Parmelia parietina, Lichen parietinus.'

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FIELD NOTES

Purple Heron at Almholme, May 1966

On the morning of 3rd May, 1966, while watching a large expanse of floodwater from the top of the Eau Beck banking at Almholme, near Doncaster, I saw what at first appeared to be a heron flying in from the east. In the moderate light of an overcast sky the bird had approached to within some 200 yards before the binoculars (13×60's), revealed an extremely dark appearance and a shape that eliminated *cinerea* immediately. As it swung over the floodwater three immature Lesser/Herring Gulls and several Black-headed Gulls lifted to meet it and commenced harrying tactics which the bird at first ignored. Dropping to about 50 feet above the water it began circling slowly within 100 yards of my position, as if searching for a suitable place to alight, when I was able to take the following description.

Only slightly larger in size than the pursuing Lesser/Herring Gulls, it had the obvious Heron features — broad, round-ended wings, head and neck tucked back into shoulders, long 'dagger-shaped' bill and long trailing legs. There were four noticeable points about this bird's silhouette, however, in which it differed from that of a common Heron's. It was smaller and slighter, with a size relationship similar to that of Herring Gull to Great Black-backed Gull, the head was quite small giving the impression that the bill emerged straight from the neck, there was a prominent bulge of neck hanging below the shoulders and the feet were very large and reminiscent of a Bittern's. Once, when the persistent gulls flew in too close, it dropped a few feet, banked and almost fully extended its long slender head and neck for a few seconds. The head, neck, back and underparts were then seen to be buff-brown with black 'necklace' marks on the sides of a pale chin and throat and buff streaks on the back. The wings were also buff-brown except for black primaries and a narrow extension of the black along the trailing edge. The long pointed bill appeared to be yellowish, the legs and feet dark. At no time was the bird heard to call. At 11.55 hrs. B.S.T., after circling the water for fully fifteen minutes, it began to gain height and, losing its tormentors, headed due west, with my binoculars on it until it was out of sight.

The bird was judged to be an immature Purple Heron, one of several Purple Herons and other rare marsh birds which appeared in various parts of the country about the same time. There are only six previous records for Yorkshire, the latest referred to by Nelson in *The Birds of Yorkshire* as shot on the margin of Farnley Pool, Otley, on 19th April, 1888. This would appear, therefore, to be the first recorded occurrence of Purple Heron in the county this century. R. J. RHODES

Early appearance of *Platychirus albimanus* Fab.

On 18th March, 1967 I took a single male *Platychirus albimanus* Fab. at sallow blossom near Haw Park, Wakefield. This narrow-bodied fly is a common syrphid and can be found in many habitats throughout the season but in my experience it is exceptional to find it at such an early date. The previous earliest record I have is 15th April (1961), and it is usually the beginning of May before it is out in any numbers. ROY CROSSLEY

Atractides latipalpis (Mot. & Tan.) a phreaticolous water-mite (Hydrachnellae, Acari)

NEW TO BRITAIN

T. Gledhill

Freshwater Biological Association, The River Laboratory, East Stoke, Wareham, Dorset

Daubrée (1887) introduced the term "nappe phréatique" to define that sheet of water closest to the surface of the soil which does not run through impermeable land, feeds common wells and whose depth varies from a few decimetres to 100 metres or more (fr. Motaş 1963). The term "phréatique" has been adopted by Motaş (1946, 1958, 1962, 1963a and b) to designate the fauna of all subterranean fresh water whether it be that of superficial gravel deposits of rivers and streams or that of the permanent water table as found in deep wells etc.

A single specimen of *Atractides latipalpis* (Mot. & Tan.) was found in a collection of water-mites from Gatesgarthdale Beck, Buttermere, Cumberland. This species is recorded only from the phreatic habitat of interstitial water associated with river and stream deposits of sand and gravel.

Gatesgarthdale Beck rises at about 2100 ft. (640 m.) on Fleetwith above Honister Hause and flows in a north-westerly direction until it reaches Buttermere at about 300 ft. (91.5 m.) above sea-level. Except in its lower reaches the stream is torrential and has a bed of boulders and loose gravel. The collection was made just upstream of Gatesgarth Farm, NY196150. The stream here is about 350 ft. (106 m.) above sea-level, 12 ft. (4 m.) wide and at the time of collecting, about 12 ins. (0.3 m.) deep. *Fontinalis* was present on some of the larger boulders.

Two sieves, one of 16 meshes the other of 60 meshes to the inch, were used to sieve gravel scooped up in an enamel mug from the stream bed. The material in the fine sieve was later sorted in the laboratory. This method is not the usual one for collecting the fauna of superficial gravel deposits of streams. The method in common use is that of Karaman and Chappuis which consists of digging into exposed loose gravels close to the stream and sampling in the water which collects in the hole. The technique used in Gatesgarthdale Beck however would sample any phreaticolous species living in the gravels of the river bed. The sampling date was 21st October 1958.

The species of water-mite found are:

Atractides latipalpis (Mot. & Tan.)
Atractides gibberipalpis Piers.
Sperchonopsis verrucosa (Protz).
Panisus torrenticolus Piers.
Kongsbergia materna Thor.
Aturus scaber Kram.
Feltria minuta Koen.

The specimen of *A. latipalpis* is a female. Several visits have been made to this locality but so far the male has not been found. The species is very characteristic and cannot be confused with the other British species in this genus (*Megapus* in Soar & Williamson 1927). The female is described and figured.

HYGROBATIDAE Koch

Subfamily: Atractidinae Oudemans 1941.
Genus: *Atractides* Koch 1837.
Atractides (*Atractides*) *latipalpis latipalpis* (Motaş & Tanasachi 1946).
Synonymy:
Megapus latipalpis Mot. & Tan. 1946 p. 17–21, Figs. 15–26; ♂, ♀.
Megapus (*Megapus*) *latipalpis affinis* Szalay 1946 p. 125–127, Fig. 2, a–f; ♂.
Megapus rectipes Walter 1947 p. 162–164, Fig. 7, a–f; ♂, ♀.
Atractides latipalpis Angelier, E. 1953 p. 57.
Atractides (*s. str.*) *latipalpis* Schwoerbel 1961 p. 252–254, Figs. 3, a–d & 7, a–d; ♂, ♀.

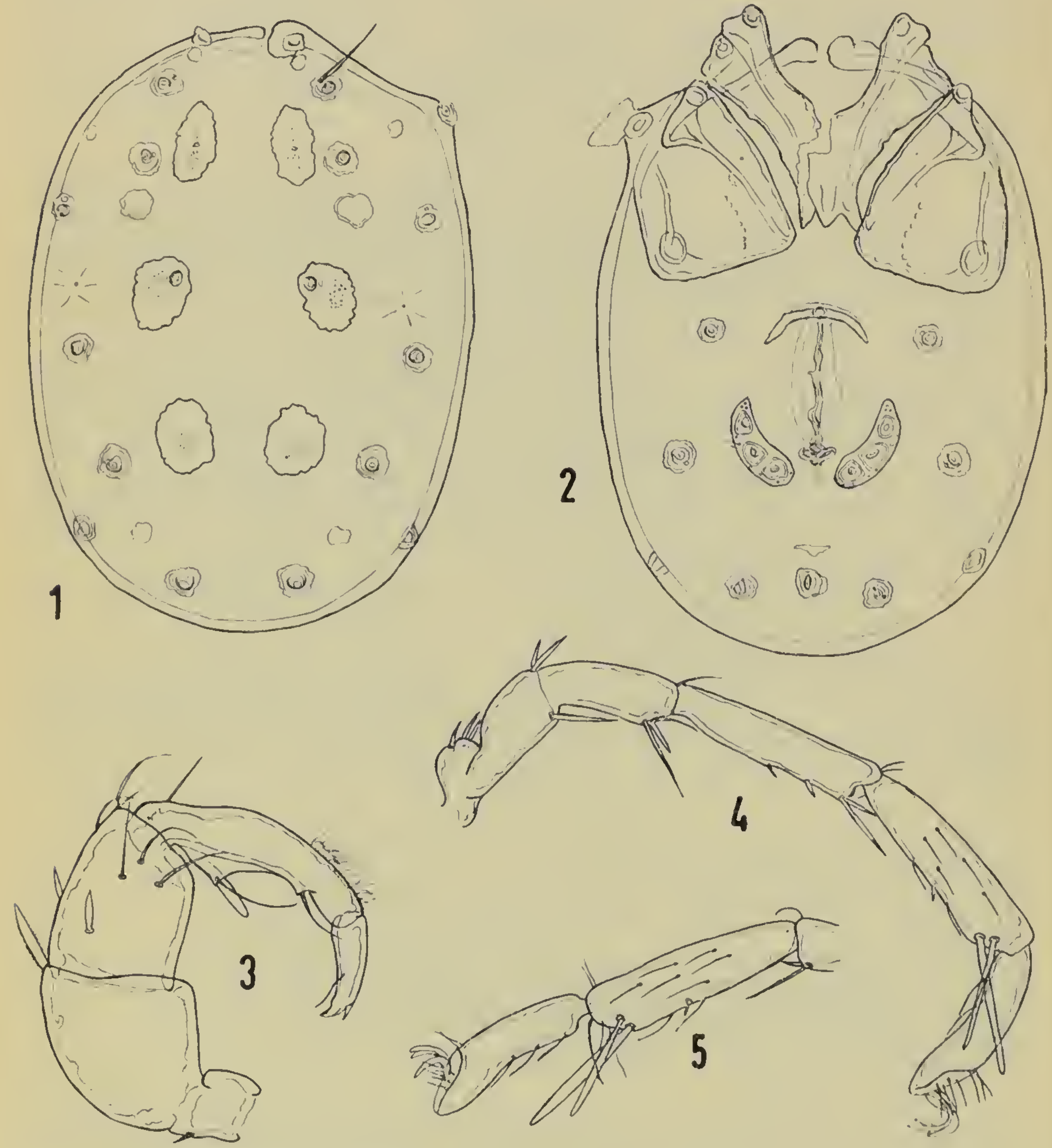
Female; prep. 345.

Body oval, somewhat flattened dorso-ventrally, anterior margin with shallow depression between antenniform bristles (not shown on figs. 1 & 2 as the specimen was damaged during dissection).

Dorsally with three pairs of prominent, more or less rounded, chitinous plates. Plates of second pair each encompassing a gland-pore and gland hair. Two pairs of smaller plates are present, the first situated posterior and lateral to first pair of large plates, second pair, posterior and lateral to third pair of large plates. Dorsal glandularia prominent, well chitinised and arranged as in fig. 1.

Epimera covering about one third of ventral surface. First and second plates and third and fourth plates fused. Anterior margins of first epimera projecting in front of body margin. Posterior margins of fourth epimera straight. Three pair of prominent glandularia in ventral integument and another pair on postero-lateral margins of body.

External genital organ large, more or less medially placed on ventral surface. The two arched genital plates well separated, posterior margins of plates rounded, anterior margins somewhat pointed. Each plate with three acetabula. The posterior acetabula lying behind posterior genital sclerite. Genital aperture long. Anterior genital sclerite well chitinised and in the form of a narrow arc. Excretory organ chitinised and placed towards posterior margin of body between hind pair of glandularia.



Figs. 1–5. *Atractides latipalpis* ♀, prep. 345.

1 — dorsal surface; 2 — ventral surface; 3 — palp; 4 — I.B.1–6 left; 5 — I.B.5 and 6 right.

Palps of characteristic shape and as in fig. 3. P.I (palp segment I) with a spine on distal extensor (dorsal) surface. P.II with a spine in middle of extensor surface (not shown in fig. 3) and another longer, pinnate spine on distal extensor margin. P.III with a short spine about midway along extensor surface and three hairs on distal extensor surface. On inside face of P.III a short spine and three hairs. P.IV somewhat expanded and with, in side view, a chitinous projection in proximal half of flexor (ventral) surface. This projection carries at its base a flattened spine and near its tip a fine hair. On distal half of flexor surface a smaller projection carrying a fine hair. Numerous short, fine hairs on extensor surface especially on distal half. P.V longer than P.I and with a fine hair on flexor surface.

I.B.5 (penultimate segment of first leg) only slightly expanded distally and with two long sword-like spines inserted close together and a fine curved bristle (figs. 4 & 5). I.B.6 slightly bent and with three fine hairs on its concave surface. IV.B (fourth leg) longer than body.

Various measurements are shown in the table together with measurements given by Motaş & Tanasachi (1946), Walter (1947) and Schwoerbel (1961). The measurements presented by Motaş & Tanasachi are those made on an immature female.

Measurements of *Atractides latipalpis* (females)

Measurements in μ		Prep. 345 ♀		Mot. & Tan. 1946 ♀		Walter 1947 ♀	Schwoerbel 1961 ♀	
Body	Length	621		362		640	612	519
	Breadth	460		225		430	380	333
Epimeral region	Length	284		208		—	279	273
	Breadth	384		217		—	—	—
Genital field	Length	189		88		—	—	—
	Breadth	178		98		—	—	—
Genital aperture length		131		64		130	128	
Genital plate length		103		—		115	112	
		Dorsal	Ventral	D	V	D	D	D
Palps	P.I	27	26	23	19	27	27	26
	P.II	90	43	56	35	90	96	90
	P.III	72	45	52	39	70	75	70
	P.IV	107	82	92	73	110	112	115
	P.V	42	37	33	33	43	46	42
Legs	I.B	577		422		585	—	—
	II.B	—		280		445	—	—
	III.B	—		320		505	—	—
	IV.B	770		468		875	—	—
	I.B.5	138		94		145	—	—
	I.B.6	115		90		120	—	—
Leg length as % of body length	I.B	93.0		—		—	95·7	
	II.B	—		—		—	72·7	
	III.B	—		—		—	73·5	
	IV.B	124.0		—		—	139·7	

The male, which is slightly smaller, 452–572μ long and 306–426μ broad (Schwoerbel 1961) differs only in the form of the external genital organ and in having P.IV slightly more distended. The male external genital organ like that of other males in the genus, has the genital plates fused into one more or less circular plate. Motaş & Tanasachi (1946 fig. 15) show the genital aperture medially on the plate, Schwoerbel (1961 fig. 3a) shows the aperture on the anterior half of the plate. The male can be separated however on the palp characters.

Atractides latipalpis is recorded from phreatic habitats in Rumania (Motaş & Tanasachi 1946, 1948; Szalay 1946); Switzerland (Walter 1947); France (Angelier 1953) and Germany (Schwoerbel 1961).

ACKNOWLEDGMENTS

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As introductions to different branches of natural history designed for the intelligent layman, these guides are models of their kind. They are well written and printed, scientifically sound and admirably illustrated by clear and artistic drawings, usually also with eight colour plates per volume. Twenty titles are now available, the latest additions covering Ferns and Fern Allies, Seashore Plants of N. California and of S. California (these deal mostly with seaweeds and include identification keys), and three volumes on the Natural History, Native Trees and Native Shrubs of S. California. The volumes slip readily into the pocket, have from 100–130 pages and are priced at from twelve to sixteen shillings each. They will doubtless be very popular with all residents and visitors who love the country and have enquiring minds; and rightly so for it is hard to see how they could be bettered.

THE LEPIDOPTERA OF YORKSHIRE

THE LEPIDOPTERA COMMITTEE OF THE YORKSHIRE NATURALISTS' UNION

It is now sixty years since the supplement to Porritt's list of Yorkshire Lepidoptera was published by the Yorkshire Naturalists' Union in January, 1904, and the Lepidoptera Committee feel that an up-to-date review of the available data is long overdue. An extensive card index has been maintained and, particularly since the Second World War, there have been many active collectors who have submitted comprehensive reports of their activities. Many new species have been added to the list while others must surely have become extinct in the county. Nevertheless, extensive as are the records, they cannot give a complete account and in the case of the commoner species a long list of localities, with dates and authorities, serves little purpose and tends to indicate the distribution of lepidopterists rather than of Lepidoptera.

There are whole areas of the county, particularly in the North-West (65), for which there are virtually no recent records while other areas tend to be visited only in certain seasons. The present account, therefore, will give a summary of the status of each species, based on the information available to the Committee. Where this is incomplete, or where published records have been overlooked, we shall welcome advice which will enable our records to be made more accurate. We are particularly interested in those insects for which we have only one, or very few, known localities. We hope that other localities will be sought and if none can be found the importance of preserving the last surviving colonies will be emphasised.

The review is published without an author's name as it represents the combined efforts of many members of the Yorkshire Naturalists' Union. A list of those responsible and an acknowledgment of all help received will appear with the final instalment. Because of the size of the county, vice-county numbers have been used wherever they are helpful in defining the distribution of a species. For those unfamiliar with the V.C. system in Yorkshire, V.C. 61 is the East Riding, V.C. 62 the eastern part of the North Riding, V.C. 63 the southern part of the West Riding, V.C. 64 the northern part of the West Riding and V.C. 65 the western part of the North Riding. The arrangement and nomenclature of the species follows that of Heslop, I.R.P. (1947), *Indexed Check-list of the British Lepidoptera* . . . with supplements.

BUTTERFLIES

PIERIDAE

Pieris brassicae Linn. (Large White).
Usually very common, though scarce some years.

P. rapae Linn. (Small White).
Common everywhere.

P. napi Linn. (Green-veined White).
Generally common in all districts.

Euchloë cardamines Linn. (Orange Tip).
Although varying in numbers from year to year, and to some extent local, it may be regarded as generally common, less so in the industrial parts of the West Riding.

Colias croceus Fourc. (Clouded Yellow).
Absent most years, though it has been seen in all parts of the county during its years of plenty. 1947 was undoubtedly the *croceus* year of the century, but it was also present in fair numbers in other years, notably 1922, 1933, 1941 and 1949.

Gonepteryx rhamni Linn. (Brimstone).
Thinly distributed, mainly in the East Riding and the extreme southern parts of the county. The former flourishing colony at Askham Bog (64) must now be regarded as at a very low ebb.

DANAIDAE

Danaus plexippus Linn. (Milkweed).
A rare migrant.
63. Kirkheaton, Huddersfield, 17th September, 1927.
64. Storiths, Bolton Abbey, 2nd October, 1934.

NYMPHALIDAE

Argynnis paphia Linn. (Silver-washed Fritillary).

Almost certainly now extinct in the county.

62. Hovingham, 3rd August, 1935.
63. Edlington, Doncaster, August, 1907; Bank Woods, Skelmanthorpe, 10th August, 1918; Emley Park, Wakefield, 14th July, 1941.

A. cydippe Linn. (High Brown Fritillary).

Almost absent throughout the county; single examples, possibly strays, have been recorded as follows:

61. Allerthorpe, 1945.
63. Bawtry, July, 1917.
64. Shipley Glen, 22nd July, 1945.

A. aglaia Linn. (Dark Green Fritillary).

Widespread but local and not often seen in the industrial areas. During recent years it has been observed, sometimes commonly, in the following localities:

61. Skipwith, 1947.
62. Pickering, August, 1941 and most years since; Ravenscar, 1958; Scarborough, 1933/1959; Pilmoor, 1963.
63. Wentbridge, 1955; Chevet Woods, Wakefield, 1963.
64. Knaresborough, common 1950/51; Washburndale, 1951.

A. euphrosyne Linn. (Pearl-bordered Fritillary).

Of similar distribution to the next species but more local; in one or two districts, however, such as Pickering (62) and Levisham (62) it is often common.

A. selene Schiff. (Small Pearl-bordered Fritillary).

Locally common in many districts in the north and east of the county (61 and 62) though there are no recent records from some localities where it was known in the past. In the West Riding, Austwick Moss (64), where it is moderately common, is the only authentic locality.

Polygonia c-album Linn. (Comma).

We have no record of this species in the present century before 1937, but in the 1940's it was noted in many localities. It has, however, failed to maintain its position, the last record being for 1957.

61. Hull, 6th September, 1942; Skipwith, 5th October, 1947.
62. Allerstone, 3rd September, 1949; Goathland, April, 1957; Pickering, 16th September, 1943; Scarborough, 1937.
63. Barnsley, several 1945 to 1950; Bradford, 3rd September, 1942; Cawthorne, 2nd October, 1948; Doncaster, several larvae 1939 and adults 1941; Elland, 2nd October, 1948; Wakefield, 10th October, 1948.
64. Harrogate, 11th October, 1946.

Aglais urticae Linn. (Small Tortoiseshell).

Always common, but less often seen in city gardens than *V. atalanta*, being more at home in the open country.

Nymphalis polychloros Linn. (Large Tortoiseshell).

Recorded only once this century, at Keighley (63/64), 1910.

N. antiopa Linn. (Camberwell Beauty).

A casual immigrant, occurring at infrequent intervals anywhere in the county.

N. io Linn. (Peacock).

Widely distributed throughout the county in varying numbers and to some extent local.

Vanessa cardui Linn. (Painted Lady).

Of fluctuating appearance, usually in smaller numbers than the next species. Often commoner near the coast.

V. atalanta Linn. (Red Admiral).

Generally common in all districts but not every year.

SATYRIDAE

Melanargia galathea Linn. (Marbled White).

There are a number of healthy colonies, principally on the chalk wolds of the East Riding where it is sometimes plentiful.

61. Burdale, 27th July, 1963; Cowlam, 21st July, 1963; also earlier records from Fridaythorpe, Ganton, High Fordon, Langtoft, Sledmere and Weaverthorpe.
62. Cayton Bay; Helmsley; Pickering; Scarborough.

Pararge aegeria Linn. (Speckled Wood).

Appears to be more common than formerly, it is local but widely distributed in the south and east. The species is especially attached to the narrow belt of magnesian limestone running north to south, passing east of Leeds towards Doncaster. This preference is surprising in view of its apparent absence from the rich carboniferous limestone areas of Craven. This suggests that there are unknown ecological factors responsible for the absence of many species from large areas of the north-west.

63. Castleford, 1946; Lindrick, 1947; Wentbridge, common most years.
64. Barwick-in-Elmet, 1957; Bishop Wood, common 1959; East Rigton, 1960; Selby, several established localities in the district.

P. megera Linn. (Wall).

This species has shown a marked increase in recent years, its present localities being too numerous to mention. In the environs of the large cities and towns of the West Riding it occurs regularly. Within the Bradford boundary it was recently observed at 1100 ft., an unprecedented occurrence.

Eumenis semele Linn. (Grayling).

Apparently increasing in numbers and localities in the eastern half of the county, including several new inland stations.

61. Kiplingcotes; Speeton Cliffs; Selby, several localities in the district.
62. Harwood Dale; Hutton-le-Hole; Kirby Moorside; Paxton Common; Pickering; Scarborough; Seamer Moor.

Erebia aethiops Esp. (Scotch Argus).

Once abundant at Grassington (64), the race formerly occurring there must now be regarded as extinct, and the species absent from the county. The last fully authenticated record from Grassington was in 1927 when W. G. Clutten found it "not uncommon". More recently, many searches have been made without success. In 1952/53 N. W. Harwood attempted to introduce the species at Wilton (62), but although the insect was seen again in 1956 it failed to establish itself.

Maniola jurtina Linn. (Meadow Brown).

Widely distributed and abundant in many areas. In recent years it has become commoner in the industrial regions of the West Riding.

M. tithonus Linn. (Gatekeeper).

Less common than formerly; now restricted to very few localities.

61. Holme-on-Spalding Moor, 1965; Kilnsey, 1965; Skipwith, one 8th August, 1953 not seen there since; formerly at Market Weighton and North Cave.
63. Thorne Moor, 1965.

Aphantopus hyperanthus Linn. (Ringlet).

Widely distributed and common in many areas in V.C. 61/62, especially on the Wolds and the Plain of York. It is absent however from the whole of Craven and indeed most of the West Riding except the extreme east and south-east where it is local.

Coenonympha tullia Mull. (Large Heath).

Its occurrence in the county is confined to a few well known and old established but restricted colonies.

62. Fen Bog, Goathland; Flask Inn, Fylingdale Moors.
63. Hatfield Moors; Thorne Waste.

C. pamphilus Linn. (Small Heath).

Well distributed and common throughout the county.

RIODINIDAE

Hamearis lucina Linn. (Duke of Burgundy).

Very local, but well established at several localities in the Pickering and Helmsley district (62). The well-known Pickering station in particular, emphasises the ecological need of this species and here it is probably more abundant than in any other locality north of the Trent.

LYCAENIDAE

Thecla quercus Linn. (Purple Hairstreak).

The present status is uncertain and owing to its habits it is likely to have been overlooked. There is no recent confirmation of many of Porritt's earlier records.

61. Skipwith Common.
62. Buttercrambe, larvae 20th June, 1942; Strensall Common, two adults 27th July, 1959.
64. Bishop Wood, 1915.

Strymonidia w-album Knoch (White-letter Hairstreak).

Not often reported in recent years but some colonies must still survive.

61. Hull district, several localities 1956.
62. Pickering and Kirby Moorside, widely distributed.
63. Formerly common in several localities in the Doncaster area, and although still there, numbers are now much reduced.
64. Bishop Wood, 1955; Fountains Abbey, 1955; Knavesmire Wood, 1955.

Callophrys rubi Linn. (Green Hairstreak).

Locally common in a variety of habitats in many parts of the county.

Lycaena phlaeas Linn. (Small Copper).

Generally common, occurs in all districts.

Aricia agestis Schiff. (Brown Argus).

Local, but usually common where it occurs. Mainly confined to the limestone district of Upper Wharfedale where several colonies are to be found, and to the chalk wolds of the North and East Ridings where it frequently abounds in many localities.

61. Burdale; Cowlam; Sledmere; Thixendale.
62. Gormire; Newton Dale; Pickering; Scarborough.
64. Arncliffe; Buckden; Grassington.
65. Redmire; Richmond.

Polyommatus icarus Rott. (Common Blue).

Porritt, writing in 1883, stated: "Generally distributed throughout the county but very scarce in some parts of the West Riding". It is interesting to note that his remarks made so long ago, still apply more or less exactly to-day.

Celastrina argiolus Linn. (Holly Blue).

Of fluctuating appearance. Seldom recorded until the late 1940's when it became widespread and common in most districts. During the last ten years, however, it has been almost absent.

Cupido minimus Fuessl. (Small Blue).

There is every possibility that this species still occurs in the county though overlooked. There are only two records in the early part of the century, both unconfirmed since.

64. Buckden, 13th July, 1908; Wetherby district, 1901.

HESPERIIDAE

Pyrgus malvae Linn. (Grizzled Skipper).

Present in a number of isolated localities, principally in the southern parts of the county.

61. Hull area, 1954.
62. Mulgrave Wood and Runswick Bay, 29th May, 1955; Sandsend, 28th May, 1955.
63. Barnsley and Doncaster area, 1958; Lindrick Common, 7th June, 1947; Wentbridge, 1951 and 1953.

Erynnis tages Linn. (Dingy Skipper).

Widely distributed in most parts of the county, but becoming scarcer and more local near the industrial areas.

Thymelicus sylvestris Pod. (Small Skipper).

Apparently absent from large areas of the county but occurring commonly though locally in the eastern half (61).

62. Strensall and adjacent areas, often in abundance.

Ochlodes venata Br. & Grey (Large Skipper).

Certainly the commonest and most widely distributed of our Skippers. It occurs in varying numbers in almost all parts of the county. In recent years it has been observed commonly in some industrial areas where it was formerly absent.

MOTHS

SPHINGIDAE

Mimas tiliae Linn. (Lime Hawk).

Confined to the south of the county; A. H. Wright established that it was breeding in the Doncaster area (63) in 1950. One or two records before this date were presumably vagrants, possibly introduced. Not reported elsewhere.

Laothoe populi Linn. (Poplar Hawk).

Common throughout the county in all suitable areas.

Smerinthus ocellata Linn. (Eyed Hawk).

Not quite as common as *populi*, particularly in the industrial parts of the West Riding where it is quite uncommon. Otherwise widespread, especially in the Plain of York.

Acherontia atropos Linn. (Death's-head Hawk).

Occurs most years in various parts of the county. Annual records of imagines vary from one to thirteen in 1956. Larvae and pupae are taken from time to time in the potato growing districts of the south and east.

Herse convolvuli Linn. (Convolvulus Hawk).

Recorded in thirty of the last fifty-eight years. Widespread, but only in the years 1917, 1927 and 1956 was it at all plentiful.

Sphinx ligustri Linn. (Privet Hawk).

Very scarce, only three records appear to be authentic and some or all of these may be due to accidental introduction.

63. Hatfield, 1906; Undercliffe, Bradford, June, 1939.
64. York, 1918.

Celerio galii Rott. (Bedstraw Hawk).

There are no records of this moth during the present century until its appearance at Scarborough in 1939. This was followed in the 1950's by more records than at any other time, mainly of larvae found on *Chamaenerion angustifolium* (Rosebay Willow-herb) growing on waste land in industrial districts. Since this peak period however it appears to have reverted to its former rarity.

62. Scarborough, two, August, 1939; one, 24th July, 1944; two larvae, 1955; two larvae, 1956; Wilton one, at *Chamaenerion* flowers, 23rd July, 1943.
63. Bradford, one larva, 1955; seventeen larvae from three localities in the town, August and September, 1958; Darfield near Doncaster, one larva, September, 1955; Horbury near Wakefield, one female, 13th August, 1959; Huddersfield, two larvae, September, 1958; Pontefract, one adult, summer, 1956.
64. Leeds, fifteen larvae, September, 1955; eleven larvae, August and September, 1958.

C. lineata Fabr. (Striped Hawk).

Another rare migrant with ten widespread occurrences in the last forty years, never more than two in one year and only once as a larva, Askwith (64), 1949.

Hippotion celerio Linn. (Silver-striped Hawk).

Of even scarcer occurrence than *lineata*; the only two in the last thirty years were evidently part of the same migration.

63. Wombwell, 1st October, 1958.
64. Great Ouseburn, 2nd October, 1958.

Daphnis nerii Linn. (Oleander Hawk).

Another very rare migrant.

61. Bridlington, 27th October, 1953; Hull, 9th September, 1926.
62. Scarborough, August, 1950.
63. Huddersfield, early September, 1919.

Deilephila porcellus Linn. (Small Elephant Hawk).

Of frequent occurrence in the eastern and southern parts of the county, less so in western districts where records are of single captures.

D. elpenor Linn. (Elephant Hawk).

This species has shown a big increase since Porritt's list was published. It is now widespread and fairly common in all areas where *Epilobium* and *Chamaenerion* flourish in both town and country.

Macroglossum stellatarum Linn. (Humming-bird Hawk).

Recorded from all parts of the county at various times. 1947 was a particularly good year. Fourteen larvae were found on *Galium verum* (Lady's Bedstraw) on the cliff at Filey Brigg (61) 20th August, 1959.

Hemaris fuciformis Linn. (Broad-bordered Bee Hawk).

Only established in one district from which it is recorded periodically.

63. Doncaster district, several captured 1936; five larvae found, July, 1955.

H. tityus Linn. (Narrow-bordered Bee Hawk).

Not recorded since Porritt's list although there is a note of "two being seen" at Helmsley (62) in 1944.

NOTODONTIDAE

Cerura bicuspis Borkh. (Alder Kitten).

There are no records for the county since Porritt's list but it has been taken just over the Derbyshire border near Sheffield.

C. hermelina Goeze. (Poplar Kitten).

Taken mainly in the Ouse Valley and usually as larvae or pupae. Empty cocoons often provide evidence of its presence.

61. Skipwith, York.
63. Sheffield.
64. Bishop Wood, York.

C. furcula Linn. (Sallow Kitten).

Similar distribution to that of *hermelina*, but rather commoner and more widespread.

61. Allerthorpe Common; Beverley; Skipwith Common.
63. Ackworth; south of Selby.
64. Kirkstall; Knaresborough; Temple-Newsam.

C. vinula Linn. (Puss).

Widespread and fairly common over the county wherever there is Poplar or Willow.

Drymonia trimacula Esp. (Marbled Brown).

A few scattered records suggest that the two established localities may not be unique.

61. Osgodby, near Selby, 1950; Skipworth Common, 1958 and 1959.
62. Great Ayton, one, 1918; Pickering, 1962 and 1963.
64. Kirkstall, one, 1957.

D. ruficornis Hufn. (Lunar Marbled Brown).

Again the firmly established localities are supported by a number of isolated captures and older records.

62. Buttercrambe Woods, larvae, 1932, one larva, 1962; Great Ayton, 1918; Pickering, 1961; several, 1965.
63. Sheffield, frequent in recent years.
64. Bishop Wood, both at light and as larvae in recent years.

Pheosia tremula Clerck (Swallow Prominent).

Fairly well distributed among Poplar and Aspen but never really common.

P. gnoma Fabr. (Lesser Swallow Prominent).

More plentiful than *tremula* and usually taken where Birch is well established.

Notodonta ziczac Linn. (Pebble Prominent).

Fairly well distributed on Sallow and Aspen.

N. dromedarius Linn. (Iron Prominent).

Generally commoner than *ziczac* and usually found wherever there is Birch or Alder.

N. anceps Goeze. (Great Prominent).

There is only one record in the last sixty years.

62. Buttercrambe Woods, one larva, 18th July, 1942.

Lophopteryx capucina Linn. (Coxcomb Prominent).

Of wide and general distribution in the county, frequently seen as the larva.

[*Odontosia carmelita* Esp. (Scarce Prominent).

We have no record although it is taken regularly within a few miles of our borders in both Nottinghamshire and Westmorland.]

Pterostoma palpina Linn. (Pale Prominent).
Not common although taken quite frequently in small numbers.
61. Barlby; Skipwith Common; York.
63. Bradford.
64. Harrogate.

Phalera bucephala Linn. (Buff-tip).
Generally distributed and often common, particularly as larvae which are partial to Limes in suburban areas.

Clostera pigra Hufn. (Small Chocolate-tip).
Still abundant in its well known stronghold at Strensall where larvae are easily found on dwarf Sallow. There are two older records.
61. Allerthorpe Common.
62. Scarborough, 1903; Strensall Common, abundant.

THYATIRIDAE

Habrosyne derasa Linn. (Buff Arches).
Well distributed throughout the county.

Thyatira batis Linn. (Peach Blossom).
Also recorded from all parts of the county.

Tethea ocularis Linn. (Figure of Eighty).
A fairly recent addition to the county list. It is now well established in the extreme south, showing signs of extending its range.
61. Skipwith Common, one, 25th June, 1965.
63. Sheffield, the first county record by W. Reid in 1950 and regularly since then; Mexborough, 5th July, 1958; Thorne, 1962 and 1963.

T. or Fabr. (Poplar Lutestring).
No recent records. Scarborough is given in Porritt's list and has been confirmed since 1900 but not recently.

T. duplaris Linn. (Lesser Satin Lutestring).
Fairly well distributed and sometimes common where there is plenty of Birch and Alder.

T. fluctuosa Hubn. (Satin Lutestring).
No recent records although this species is now regarded as much commoner than formerly in other parts of England.
63. Haw Park, Wakefield, 1908, 1910, 1914 and 1918 but not since.
64. Grassington, included in a list for Grass and Bastow Woods published in 1930.

Asphalia diluta Schiff. (Lesser Lutestring).
Only one recent record.
62. Buttercrambe Woods, late August, 1938.

Achlya flavicornis Linn. (Yellow Horned).
Generally widespread among Birch and often common.

LYMANTRIIDAE

Orgyia gonostigma Fabr. (Scarce Vapourer).
A very local species with a few strongholds in the south of the county.
61. Skipwith Common, larvae common, 1960.
63. Doncaster, 1938 and 1948; Thorne, 1960.
64. Selby, 1939 and 1956.

O. antiqua Linn. (Common Vapourer).
Generally distributed over most of the county.

Dasychira fascelina Linn. (Dark Tussock).
Not reported since Porritt's list.

D. pudibunda Linn. (Pale Tussock).
Not common but odd specimens frequently appear away from the industrial areas.
61. Skipwith, 1961; York, 1943.
62. Buttercrambe, 1935; Scarborough, 1958; Strensall, 1944.
63. Sheffield, fairly common in 1958.
64. Bishop Wood, 1955; Knaresborough, 1959.

Euproctis chrysorrhoea Hubn. (Brown Tail).
Not reported since Porritt's list.

Euproctis similis Fuessl. (Gold Tail).
Common in most parts of the county, particularly as larvae on hedgerows. Almost absent however from the industrial areas.

Leucoma Salicis Linn. (White Satin).
A rare moth in the County.
61. Drax, larvae 1932 and 1936; Templehurst Wood, 1946.
63. Bradford, 1953; Thorne, 1962.
64. Bishop Wood, larvae plentiful but mostly parasitised 1955 and 1956.

Lymantria monacha Linn. (Black Arches).
Not reported since Porritt's list.

LASIOCAMPIDAE

Malacosoma neustria Linn. (Common Lackey).
Its distribution just reaches the southern boundary of the county.
61. Spurn, one, July, 1953.
63. Thorne, 1962.

Trichiura crataegi Linn. (Pale Eggar).
Widespread in wooded areas but not common.
61. Barlby, two 27th August, 1965; Skipwith, larvae, 1955/6.
62. Buttercrambe, one larva, 1932; Sandburn and Strensall, frequent in recent years; Thornton-le-Dale, one larva, 1953.
63. Finningley, a few larvae, 7th June, 1965.
64. Askham Bog, 1950; Knaresborough, 1960 and 1962.

Poecilocampa populi Linn. (December Moth).
Fairly well distributed in the woodland areas.

Eriogaster lanestris Linn. (Small Eggar).
All recent records are from the Pickering area (62) where larval webs are frequently found.

Lasiocampa quercus Linn. var. *callunae* (Northern Oak Eggar).
Common on moorlands and heaths, some years occurring in great abundance.

Macrothylacia rubi Linn. (Fox).
Well distributed throughout the county in suitable localities.

Philudoria potatoria Linn. (Drinker).
Generally distributed and often abundant in all low lying areas.

Gastropacha quercifolia Linn. (Lappet).
Of very rare occurrence, evidently the county is really just beyond its northern limit.
61. Skipwith Common, two larvae, October, 1951.
63. Doncaster, one, July, 1945.

SATURNIIDAE

Saturnia pavonia Linn. (Empress).
Commoner on the high moorland than on the low lying heaths.

DREPANIDAE

Drepana binaria Hufn. (Oak Hook-tip).
The first county record was by S. M. Jackson, near Selby (63) in 1937. Since the war there have been a fair number of records from the central part of the county.
61. Barlby, August, 1965.
62. Sandburn.
63. Selby; Wath-on-Dearne.
64. Harrogate; Knaresborough, two broods were recorded in Birkham Wood in 1962.

D. falcataria Linn. (Pebble Hook-tip).
Fairly widespread in suitable areas.
61. Skipwith Common.
62. Strensall Common; Pilmoor, 1948 and Gormire, 1948 are the most north-easterly records.
63. Barnsley; Bradford; Shipley; Wentbridge.
64. Harrogate; Knaresborough; Selby; Grassington, 1938 is the most north-westerly record.

(*To be continued*)

CONSERVATION IN YORKSHIRE

CLIFFORD J. SMITH

Upper Teesdale

The final debate on the Tees Valley and Cleveland Water Bill took place in the House of Lords on Thursday, 23rd February. A reservoir will now be built at Cow Green in Upper Teesdale. Conservationists have lost the battle and botanical research has suffered a serious blow. Although Cow Green lies just outside Yorkshire, the effects of the final decision on its fate will be felt in this county as well as throughout the country as a whole. The following comments are reprinted from *Habitat*, the monthly newsletter issued by The Council for Nature to all its members.

'The two Petitions, the Hearings before Select Committees of both Houses, the three notable Debates and the wide interest and support engendered by the Teesdale Defence Committee have not been in vain. The basic need for conservation has been demonstrated and, indeed, acknowledged in principle. The sorry practices of what passes for planning but is more fairly and accurately described as piecemeal provision have been shown in detail. Though a good deal of complacency remains, support for the Bill has been uneasy; its stop-gap nature is admitted; there has been no undertaking that the Middleton site will not later be demanded for another reservoir. The unease is doubtless due partly to such uncertainties, but it may also reflect belated recognition of the seriousness of the attrition of the countryside. Changes undoubtedly must take place to accommodate the growing requirements of populations and its developing industrial techniques. But Cow Green has shown in an uncomfortably clear light that the forces of expansion are considered justified in themselves; that they are unaccustomed (and not much encouraged by authority) to bend at all from a narrowly economic policy and that other values are given short shrift. This is not a criticism of the Select Committees which could hardly have reached any other decisions in the prevailing circumstances. They have indeed done a public service in uncovering some basic discrepancies in the approach to these problems.

'Among many matters brought to light is an apparently minor detail which requires legislative reform before efforts being made in forward planning can achieve anything in practice. The Water Act of 1945 precludes water boards from making any charge against the industries for whom they are planning a supply beyond that already demanded. The cost of forward planning must therefore be borne by water ratepayers as a whole. The difficulty of long-term planning in these conditions is apparent. This provision of the Act has not been modified by the Water Resources Act 1963. Until it is amended, water authorities will continue to make piecemeal provision, largely nullifying the advantages otherwise to be expected from the long-term planning of Water Resources Board.

'Another vital detail highlighted by the House of Lords Select Committee and which will require vigilance is the position of witnesses in the employ of statutory quasi-governmental bodies. Officers of the Nature Conservancy, for example, are frequently called as witnesses at public inquiries into development projects where these may affect the interests of conservation. The Nature Conservancy, now part of the Natural Environment Research Council, is responsible to the Department of Education and Science and it has been suggested that its witnesses should accept direction from the Department as to what they state at hearings and inquiries. Similarly, that the National Parks Commission should be subject to direction by the Ministry of Housing and Local Government. Fortunately such views expressed in the Debate on 23rd February were not well received by several speakers. There is something odd in their being applied to the two bodies mentioned as if their position was different from that of the many other agencies (such as the Forestry Commission, the National Coal Board and the Water Resources Board) set up under the authority of Parliament to pursue different aspects of the national interest. The special knowledge and advice of scientists and other expert witnesses must remain available to the public and any attempt by Ministers to establish a right to instruct them in the manner suggested must clearly be firmly resisted.

'The most bitter lesson of Teesdale and the most difficult to overcome is the inevitability of the decision. Now that the reasons for this have been brought fully into view, however, it may at least be possible to begin logically and methodically to break them down. The chief arguments used by the promoters of the Bill fell under four heads: economic; opportunities for or threats to employment; urgency; and a contribution to exports. Variants of these four arguments may be used in any of hundreds of similar cases which come up in the foreseeable future. Whether rational or emotional, or even at times irrelevant, they are easily understood by an independent tribunal, at a public inquiry or in a Select Committee of Parliament. What conservationists had not perhaps appreciated was that their own arguments, whatever their merits, are not readily understood by laymen and even if they were are unlikely to influence them in the face of predictable arguments of expediency appropriately tailored to fit the case.'

Liaison between the Trust and the Union

It is therefore appropriate that, with a greater potential threat to all the best regions of Yorkshire, the Trust and the Union should be planning to work even more closely together. Towards the end of 1966, this matter was considered at meetings of the two organisations, and in February this year at a preliminary meeting of representatives of the Union and the Trust, under the chairmanship of Mr. Donald Walker, initial recommendations were agreed for consideration by the Executive Committees of the Union and the Trust, in the first instance separately. It is too early to anticipate what may arise from closer co-operation, but it is certain that nothing but good can come from it.

BROCKADALE NATURE RESERVE: Within a year of declaring the Brockadale Reserve, near Wentbridge, the owners of an adjoining area of land have been in touch with the Trust. As a result, the strip of meadowland between the wood and the River Went has been added to the property under the control of the Trust. We are most grateful to Mr. Donovan Glover and his family for making this possible, and assure them that we are delighted to have another group of habitats on the magnesian limestone for the development and conservation of its particular flora and fauna. Members of both Union and Trust are encouraged to visit this enlarged Reserve during the coming summer.

EXPANSION OF THE TRUST: On 2nd May, 1967, the Trust celebrates its 21st birthday, and as if to anticipate the occasion there has been a rapid growth of practically every aspect of its work and influence. The number of Nature Reserves almost doubled in twelve months, its membership almost doubled in a similar period, and major changes took place in its administrative structure. At the beginning of 1967, Mr. W. W. Hall took up his appointment as full-time, paid Assistant Secretary to the Trust; soon after that, the Trust rented its own office accommodation in York which is now its Registered Office. It would be most helpful if all correspondence in future is addressed to Mr. Hall at *Clifford Chambers*, 4 *Clifford Street, York* (*Telephone: York* 59570). Mr. Hall will be in charge of most of the normal business administration of the Trust, its publications and its publicity, but he will refer all matters directly connected with natural history and practical conservation to those members of the Trust qualified to advise on such matters. There is just as much scope for the field naturalist and the conservationist in the new organisation as there was in the old, and the general policies of the Trust will be intimately bound up with the interests of the field naturalist.

SPECIAL OCCASIONS IN 1967: The Trust will be actively concerned with a number of special meetings, conferences, etc. during the coming season, and members of the Union and the Trust may like to have the following details:—

Humberside Conservation: A conference is to be held in the Botany Dept., Hull University on 14th and 15th April to give conservationists and those concerned with economic development the opportunity to hear and discuss each others' views on the development of land in the Yorkshire and Humberside Region.

Y.N.T. Annual General Meeting: This will be held in York at 2.30 on Saturday, 22nd April and will be followed by a talk given by A. E. Smith, Secretary of the County Trusts' Committee of the S.P.N.R. This organisation co-ordinates the work of the various Trusts, and Mr. Smith will be showing a film which has just been produced for the Lincolnshire Trust. His talk is open to the general public.

The Great Yorkshire Show: The Trust is renting a stand at the Great Yorkshire Show and we are determined to make it a much more attractive centre than last year. Already a considerable amount of exhibition material has been collected.

The Harrogate Festival: The theme of the science side of this Festival will be that of Nature Conservation, and we are happy that the Trust and the Union will be working closely together to present the case for the local naturalist. While national bodies are bound to have greater financial resources to put on most impressive features, we hope that the Trust and the Union will also make their impact. The Festival takes place during the middle of August.

THE TRUST FILM: We are planning to produce an 8 mm. colour film (silent) covering each of the Trust Nature Reserves. This will be entirely the work of amateur naturalists, and already volunteers have come forward to undertake Askham Bog, Moorlands, Strensall Common, Hayburn Wyke, Garbutt Wood, and probably Grass Wood. Members of the Union who would like to help the Trust by covering one of the other Trust Reserves should get in touch with the Assistant Secretary of the Trust for fuller details.

NEW PROPERTIES: The Trust has not declared any new properties since the Bride Stones, mentioned in the autumn issue of *The Naturalist*. Matters are well advanced in the negotiation for a number of additional properties, and providing the solicitors are able to press ahead, we hope that at least another four new Reserves will be declared before the summer. Details of each site will be sent to the local and national press as each one is declared, but full details will be given in the next article in this series.

May we take this opportunity of thanking Union members for purchasing Christmas Cards and ties from the Trust. A profit of well over £100 was recorded, and this sum has been most useful in meeting the considerable expenses of setting up the eight Nature Reserves declared in 1966.

NOTES ON THE WINTER POPULATIONS OF GOLDENEYE AND RED-BREASTED MERGANSER IN SOUTH MORECAMBE BAY

M. E. GREENHALGH

These notes are the result of three years' close study of the populations of Goldeneye (*Bucephala clangula*) and Red-breasted Merganser (*Mergus serrator*) in south Morecambe Bay. These two species are winter visitors in quite large numbers to Morecambe Bay. Their daily routine is closely connected with the tidal rhythm which affects their food supply and food availability; the main areas over which they feed are covered only at high tide. It would appear that feeding is the main winter activity.

The area covered by the study is the southern half of Morecambe Bay, the western boundary being Heysham and the eastern being Silverdale and Carnforth. The centre of this area is Morecambe.

The Populations

Goldeneye and Red-breasted Mergansers are winter visitors to the Bay and few arrive in the area before late September although odd ones may appear in August and July. It is not until mid-October however, or even November, that flocks of any size are noted. In 1965 for example, the first large flock of about 50 Red-breasted Merganser appeared on 3rd November, that of 31 Goldeneye appearing on 10th November. In 1966, 22 Red-breasted Merganser were recorded on 19th October, increasing to 358 by 11th November and 35 Goldeneye were noted on 2nd November. It is noticeable that the majority of these first arrivals, including the first larger flocks, are mainly 'brown-heads'— immatures or adult females.

Numbers build up quickly, peak numbers for both species being recorded between November and January. The actual peaks vary from year to year, Goldeneye numbers often being in excess of 120 whilst Red-breasted Merganser peak numbers have varied in recent years between 200 and 400. It was noticeable that in the cold period of the 1962–63 winter, and in the following winter, numbers of both species were very small and it was not until autumn 1964 that numbers again built up. The high peaks are very unstable in the Bay; in extremely cold periods numbers disperse whilst in very mild conditions some remain in the mouth of the Bay and the Lune estuary and do not confine themselves to the Bay. It also appears that small fluctuations occur in the area depending on tide height, numbers usually being higher with higher tides. During strong westerly gales I have found a high concentration of Red-breasted Merganser in the area whilst Goldeneye are much reduced in numbers. There is a very rapid decrease in spring, the last birds leaving in April.

As stated above, the majority of the early arrivals are 'brown-heads' but when peak numbers are present in the Bay, adult males are more numerous and may attain 70% of the Red-breasted Merganser flocks and 60% of Goldeneye flocks.

The Daily Cycle

It appears that in Morecambe Bay the daily cycles of the wintering Goldeneye and Red-breasted Merganser are largely controlled by the tides. As the tide comes in, covering the mudflats and mussel beds, so most Goldeneye and Red-breasted Merganser come right into the Bay from the sea and channels of the mouth of the Bay where they roost and feed at low tide, to feed. The influx occurs during the two hours preceding high tide. It is independent of the time of high water, and I have found that when high tide is just before dawn or just after dusk, both species have followed the tide into the Bay. Similarly, as the tide recedes, they mostly pass in a westerly direction, spending the low water period out at sea or in the mouth of the Bay although small numbers remain in the Bay to feed.

The high tide period is the main feeding period. Most Goldeneye feed over the flooded mussel beds and mudflats where the water is up to two or three fathoms deep. Red-breasted Mergansers also feed over the mussel beds in the Bay. Local fishermen have built a series of fish traps on certain mussel beds and Red-breasted Merganser, and possibly also Goldeneye, feed on small fish as they become caught in the trapping area as the tide recedes. These traps catch large quantities of 'whitebait': young spratts and herring. Besides these fish resources, the mussel beds also provide the ducks with other suitable food especially crustaceans and molluscs.

Other feeding areas that are used include boating lakes off Morecambe promenade. Goldeneye and sometimes Red-breasted Merganser can be seen each high tide feeding in these pools which are five to six feet deep and contain various crustacean and mollusc foods. The estuary channels which dissect the mudbanks in the Bay also provide feeding areas for the sea ducks; fishing flocks of Red-breasted Merganser and Goldeneye feed in the Keer and Kent channels, not only at high tide, but also at low tide. At low tide small pools on the mussel beds attract small numbers of Goldeneye which feed mainly on crustaceans found there.

The feeding rate of both species is dependant on several factors. Water depth is one important factor; Goldeneye feeding in the boating lakes at Morecambe average 43 dives per hour when feeding in about five feet of water, the dives varying from 15 to 42 seconds in length with an average of 20.5 seconds. In calm seas over the mussel beds (up to three fathoms of water) feeding Goldeneye average 26.3 dives per hour, the average length of the dives being 41.3 seconds. The difference between the number of dives in one hour and the average length of the dives between the two sites are significant. A similar situation also occurs, but to a lesser extent, in Red-breasted Mergansers. Those feeding in deeper water dive less times per hour than those feeding in shallow water and in the former case the length of the dive is longer.

In general it also appears that the feeding rate decreases with rough seas, in heavy rain and strong winds and also in the turbulent water of the estuary channels as the tide recedes. This is undoubtedly due to the fact that this water would be so clouded with suspensions of clay particles that this would make food harder to find for the ducks which appear primarily to use their eyes to locate food. The quantity of food available would also affect the feeding rate.

Often large flocks of both Goldeneye and Red-breasted Merganser feed together, diving and surfacing simultaneously. Shoals of fish can easily be controlled by a large feeding flock of duck whereas a single bird or very small group would tend to cause the shoals to disperse radially. By driving the fish, as has often been seen, in a common direction, more fish can be taken per bird than if the birds simply attacked in a haphazard way. Co-ordinated feeding of flocks of Goldeneye has also been watched at low tide in shallow pools on the mussel beds and shallow channels where fish fry, shrimps, and other crustaceans were the prey.

The Secret Islands by **Franklin Russell.** Pp. 238. Hodder & Stoughton 1966. 25/-.

A description of life on a group of islands, habited and uninhabited, lying off the eastern coasts of Canada and Newfoundland. The author's main interest was the bird life of the islands but you could be excused for not realising this if you omitted to read the wrapper. He has great difficulty in calling a spade a spade — thus puffins are 'humorless, homuncular soldiers dressed in immaculate accoutrements'. In short, the book adds little to ones knowledge of sea-birds but makes one realise the limitations of ones vocabulary. D.F.W.

AUTUMN FORAY, SCARBOROUGH, 15th–19th SEPTEMBER, 1966

W. G. BRAMLEY

'Where have all the fungi gone'; this was the cry that went up from the dozen or so members and friends when they explored the Scarborough area. Never in the writer's experience have the larger agarics been so few in numbers. Although some eighty species were finally listed many, even common ones, occurred in very small numbers and it is due to the collecting and naming by Mr. M. Richardson of some two dozen Coprinus and Mycena species that the list is so large. He is also responsible for the great majority of the ascomycetes which will be seen to be coprophilous in origin.

As a rule when collecting is scanty some compensation is often found in the discovery of some unusual species. This time it was the discovery of *Pluteus plautus,* several collections of which were made on coniferous sawdust at Cloughton. This had been deleted from the 1960 check list and may be more common than indicated as it is easily mistaken macroscopically for *P. cervinus.*

† = Not in Mason & Grainger's *Catalogue of Yorkshire Fungi.*
* = Not in Mason & Grainger's *Catalogue of Yorkshire Fungi* for V.C. 62.

B = Bickley
C = Cloughton
F = Forge Valley
L = Langdale End
H = Hackness Park
O = Oliver's Mount, Scarborough

c = cow dung
d = donkey dung
h = horse dung
r = rabbit dung
rd = roe deer dung
s = sheep dung

PHYCOMYCETES (M. Richardson)
Pilaira anomala (Ces.) Schroet., W(r); L(r)
†*Piptocephalis lepidula* (Marchal) Benj., L(r)
P. repens van Tiegh. & Le Mon., W(r)

ASCOMYCETES

DISCOMYCETALES (M. Richardson and W. G. Bramley)
†*Ascobolus furfuraceus* Pers. ex. Fr., L(c); W(c)
A. glaber Pers. ex. Fr., C(r); L(h); O(d)
A. (*Dasyobolus*) *immersus* Pers. ex. Fr., L(r); R(s); W(c.r)
†*A. winteri* Rehm, W(r)
Ascophanus argenteus (Curr.) Boud., L(h); O(d); W(c)
†*A. keithii* (Phill.) Boud., L(h); O(d)
†*Ascozonus woolhopensis* (B. & Br.) Boud., C(r)
Cheilymenia cf. theleboloides (A. & S.) Boud., W(c)
†*Lamprospora crec'hqueraultii* var. *macrantha* Boud., L
†*Pezicula rubi* (Lib.) Messl., on *Rubus* stem, L
†*Ryparobius polysporus* (Karst.) Sacc., L(r); O(d); R(s); W(s)
†*R. sexdecemsporus* (Crouan) Sacc., L(h); O(d)
Saccobolus depauperatus (B. & Br.) Rehm, L(h)
S. kerveni (Crouan) Boud., L(h)
S. neglectus (Crouan) Boud., C(r); L(r); R(s)
†*Thelebolus nanus* Heim, C(r); L(r); R(s); W(r)
T. stercoreus Tode ex Fr., C(r); L(r)
Taphrina tosquinetii (West.) P. Magnus, (= *alnitorqua*), L

PYRENOMYCETALES (M. Richardson)
†*Coniochaeta discospora* (Auersw.) Cain, H(r)
†*Podospora curvula* var. *coronifera* (Grove) Moreau, sub *Sordaria*), L(c); W(c)
**P. setosa* (Wint.) Niessl, (sub *Sordaria*), C(r); L(r)
**Sordaria fimicola* (Rob.) Ces. & de Not., O(d)
†*Sporormia ambigua* Niessl, C(r); L(h)
†*S. octomera* Auersw., C(r)

BASIDIOMYCETES

AGARICALES (M. Richardson et al.) (Authors according to 1960 Check List)
†*Coprinus bisporus*, L(c); W(c)
**C. ephemeroides*, L(h)
†*C. heptemerus*, C(r.d); L(r); R(s); W(c)
†*C. miser*, L(c.h.r.); O(d); R(s); W(c)
†*C. pellucidus*, W(c)
†*C. cf. poliomallus*, L(c); W(c)
†*C. stercoreus*, C(r.d); L(c); R(s); W(r)
†*Galerina clavata*, L (certe R. Watling)
**Inocybe napipes*, C
**I. proximella*, B
†*Mycena amicta*, B
†*M. crispula*, B
Naucoria scolecina, L
†*Pluteus plautus* (sensu P. D. Orton), C (det R. Watling)

APHYLLOPHORALES (W. G. Bramley)
**Polyporus stipticus* (Pers.) Fr., C, F

GASTEROMYCETALES (W. G. Bramley)
†*Lycoperdon excipuliforme* (Scop.) Pas., C
L. pusillum (Batsch) Pers., B (sub *L. polymorphum*)

FUNGI IMPERFECTI (W. G. Bramley & M. Richardson)
†*Hadrotrichum virescens* Sacc. & Roum., F, on living *Agrostis* leaves.
†*Mastigosporum rubricosum* (Dearn. & Barth.) Sprague, on *Dactylis*.
†*Rhopalomyces elegans* var. *apiculatus* M. B. Ellis, L(c); W(c)
Sphaeronaemella fimicola Marchal, C(r.d); L(h.r); R(s)

BOOK REVIEWS

An Introduction to the Algae, by **Ian Morris.** Pp. 189 with 31 text figures. Hutchinson University Library, London. 1967. Paperback, 13/6d., Hardback, 32/6d.

This very poor book is a disappointing addition to an excellent series. It presents a superficial and inexpert survey of the algae which cannot possibly be recommended for use by either students or their teachers. The text consists of gleanings from Fritsch (1935), Smith (1955) and Fott (1959), with out-of-date information well represented. This material is interlaced with summaries of an apparently arbitrary selection of recent research papers, in some cases misinterpreted. The illustrations are secondhand, badly drawn and often approach a standard which would be castigated in the work of an elementary student. In some particular drawings, though an authority is quoted, the author has added incorrect details of his own. The text is little more than 150 pages in length, and yet my notes of factual errors and misconceptions cover several pages of closely-written foolscap. Chapter and verse to some of the errors will be given in a more detailed review in *Nature*; little point will be served by doing so here. Altogether, a book to forget. G.F.L.

World Vegetation by **D. Riley** and **A. Young.** Pp. 96 with 122 photographs, 4 colour plates and 1 map. Cambridge University Press, 1966. 11/6.

At 11/6d. this book is worth buying for the excellent photographs alone. It deals section by section with all the major types of vegetation in the world, introducing many principles of biogeography at the same time. Naturally in a book of this size, devoted mainly to illustrations, the text tends to be of a very general nature and consequently in some parts is rather oversimplified. Mistakes are few but there are some which should be pointed out as in Fig. 96 which surely is of *Salix herbacea* and not *Betula glandulosa* and in Fig. 108 the dark plants, with one doubtful exception, are *Polytrichum* and not *Narthecium*. Also in this section is the comment that acid peat is bog peat while calcareous waters produce fen peat, an oversimplification which ignores the fact that many fens develop under acid conditions. The 16 colour photographs of various soil types are of a high quality. The book is aimed at Advanced Level students but should be useful for anyone interested in plant geography. D.D.B.

A Dictionary of the Flowering Plants and Ferns by **J. C. Willis.** Seventh edition, revised by **H. K. Airy Shaw.** Pp. xxii + 1214 + liii. Cambridge University Press. £5.

Willis's Dictionary occupies a unique place in botanical literature. It is one of those quite indispensable reference books which every serious botanist consults repeatedly. To be without a Willis ready to hand is to be as incompletely equipped as to be without a lens in one's pocket.

It is now 70 years since the first edition of the Dictionary appeared and the last edition — five times reprinted — was published as long ago as 1931. Since then a multitude of new generic and family names have appeared and many changes in classification have been proposed. These have made increasingly more needful an entirely new edition incorporating all this information. The formidable task of its preparation has committed Mr. Airy Shaw and his helpers to more than five years hard labour and the resulting volume, with nearly twice the number of pages of the last edition, has been reset in a larger and more modern format.

The new Willis departs more from its predecessors than they did from one another, since the information now is arranged wholly under the 40,000 generic, family and ordinal names. In former editions these were interspersed with accounts and articles covering vegetative and reproductive organs, forms of vegetation such as climbing plants, insectivorous plants, mangroves, and economic products such as oils, latex, resins, dyes, etc. How useful it was too to look up cloves, curare, kumquat, taro, or vegetable sheep, dancing girls, Hottentot fig and a host of others and find the way to the scientific via the colloquial name. All these, together with the occasional illustrations and diagrams of the past, have been stripped from the present volume which is in consequence a more austere and arid array of facts. The change was inevitable; if all had to be included in a single volume something had to go to make way for so much new matter. But the old Willis will still have its uses alongside the new. Nomenclature experts will approve of the inclusion of many hundreds of orthographic variants and alternative spellings — often obvious slips or misprints in the first place. Others will find these a less useful and expendable exchange for what has been sacrificed for their inclusion. Doubtless this is one of the unresolvable dilemmas confronting anyone whose task it is to pour new wine into an old bottle. One misses the useful references formerly included under many genera, indicating to which sections of a large family the genus belongs. Since these references were given simply as numerical symbols, conservation of space by their elimination is negligible. No entries have been more radically overhauled than those relating to the Pteridophyta for which Professor Holttum, who supplies a separate introduction to the group, is responsible. Meticulous care has evidently been given to the laborious task of proof reading but omissions are less readily detected than errors and unfortunately Mr. Hunt's article on Gymnospermae, acknowledged in the preamble, has been omitted altogether.

Mr. Airy Shaw has had the assistance of many colleagues and friends at Kew and elsewhere in the preparation of this massive work. The immense amount of information which it contains and the impress of scholarship and authority which it carries compel an admiration tinged with awe. It will be in constant use by botanists throughout the world for many years to come and not a day will pass without someone, somewhere, giving grateful thanks for the new Willis, and all the toil which has been expended by its reviser and his assistants in its preparation. W.A.S.

Annelids, by **R. Phillips Dales.** Pp. 200 with 19 text figures. Hutchinson University Library, London, 1967. Paperback 10/6d., Hardback 25/-.

This useful little book appeared first in 1963 and is now available in paperback form at a very reasonable price. In modest compass it gives a readable account of the functional anatomy of the annelid worms and can again be warmly recommended to all readers beginning a serious study of the group. It is attractively produced but could more correctly be described as a 'New Impression' since it appears to be identical with the last edition. T.K.

On Growth and Form by **D'Arcy Thompson.** Abridged edition, edited by J. Tyler Bonner. Pp. xiv+346 with 2 photographic plates and 181 text figures. Cambridge University Press. 15/-.

A paperback version, at less than half the price, of the edition issued in 1961 and reviewed in *The Naturalist* 71, 1962.

The Territorial Imperative, by **Robert Ardrey.** Pp. 390 with 54 text illustrations by **Bernine Ardrey.** Collins, 1967. 36/–.

Any readers of *African Genesis* can reasonably expect, when they open a book by the same author on 'a personal enquiry into the animal origins of property and nations', that they will find a narrative that is certainly highly personal and also widely informed and very readable. Ardrey has a keen eye for the example which is both relevant and striking, whether it be territory in the slime moulds or boredom in the flatworms, and an attractive generosity towards authors whose work appeared too early to receive the attention it deserved. Much of the pleasure of the book for a naturalist will be derived from the actual information, much of it fascinating and unfamiliar, used to illustrate the bewildering varieties of territory and associated behaviour, but this simply forms the basis for the more serious theme of the book, namely that the future of our own species depends on a better understanding of the true nature of man. Ardrey's own opinion is certainly unequivocal —'man is not all sex, and not all economics, and not all cultural tradition, and not all a pot rounded on environment's wheel . . . We are also predators'— and his attitude towards our moral nature, derived from the later work of Alfred Russel Wallace and Sir Arthur Keith, is that this has evolved quite naturally during our early human and our pre-human stages. He indeed suggests that a 'moral nature' is not a unique human characteristic at all, so that comparative studies on other animals, where they are relevant, can supply valid data for the understanding of man. There is no doubt of the importance of this question in the search for more satisfactory solutions to our problems of crime and delinquency and above all the risk of war, so if the reader is prepared to consider Ardrey's point of view he will find it presented here with a great deal of evidence as well as with gusto and clarity.

T.K.

Ecology of Parasites by **N. A. Croll.** Pp. 136 with 4 plates and 35 text figures. Heinemann Educational Books Ltd., 1966. 18/–.

This slim volume comprises an account of the main non-physiological and non-biochemical aspects of animal parasitology. The approach is fresh and up-to-date and the author has marshalled his very diverse material into logical and orderly sequence. Following an introductory consideration of parasitism in relation to other forms of animal association, the basic attributes of the parasitic habit are described. Subsequent chapters deal with transmission, host-parasite relationships, host specificity, parasite evolution, parasite distribution and the association between parasites and disease. Three rather sketchy appendices provide hints on laboratory technique, a key for the separation of parasitic worms and a tabulated summary of information on parasites referred to in the text.

Unfortunately the treatment of some topics is excessively superficial through compression and there are numerous errors of nomenclature and some of fact. The nematode named *Crassicauda* in three places including the index is in reality *Trichosomoides crassicauda*, and the male lives not in the female vulva as stated but in the vagina or uterus. *Trypanosoma gambiense* of p.98 is unaccountably transformed into *T. vivax* on p.99. To the uninitiated Plate 2 will be something of a puzzle because of the inadequate and erroneous legend. Although such shortcomings detract from the value of the book, it should still provide a useful and stimulating introduction to the study of parasitism.

R.W.O.

Man and Beast by **R. A. Marchant.** Pp. 148 with 8 drawings by Maurice Wilson. G. Bell & Sons Ltd. 1966. 18/6.

Mr. Marchant's theme is the relation between man and animals. Early legends of hunters and their methods and the probable origins of domestication of animals lead on to an examination of how, from the Middle Ages onwards, fashion has brought about selective persecution of species. Some law suits involving animals are described and the uses to which species have been put in science, work, war and for educational and recreational purposes in zoo's and menageries, are considered. Concern for the humane treatment of animals led to the founding in Liverpool in 1809 of the forerunner of the present R.S.P.C.A. Russian protection of the Sea Cow in 1755 and Charles Waterton's bird sanctuary are cited as early instances of the changing outlook which has led to modern conservation methods and the many bodies now actively concerned with preservation of wild life. Both the subject matter and manner of presentation will commend this book to the general naturalist.

Against the Wind, by **Douglas Sutherland.** Pp. 210 with 15 black and white photographs. Heinemann, 1966. 30/–.

The author, a well-known writer and Orcadian, returns to his childhood home in the Orkneys for a brief idyll. This book compares island life in the two periods of his residence and ranges wide over the Orcadian scene. It is not by any means a natural history book but Mr. Sutherland does discuss seal-culling in a locale and manner which we Farne Islands-oriented naturalists may not be familiar with. The fact that the Snipe has no stomach and can thus be recommended for cooking by bachelors came as a surprise to me! T.M.C.

Animals that Changed the World by **P. D. C. Davis** and **A. A. Dent.** Pp. 127 with 25 drawings by Sven Berlin. Phoenix House, 1966. 25/–.

This is an adaptation of the late Professor Zeuner's *History of Domesticated Animals* and is intended primarily for younger readers. I find it hard to imagine the readership which it will attract though it is a reasonable and readable account of the processes of domestication. The lesser known side-tracks of the subject come out best in my opinion, for example the partial successes such as gazelle and elk, the other more familiar creatures being rather sketchily treated. The section on sheep and goats (a subject which has interested me of late) I can only describe as 'woolly'.

However, at a certain age and stage both the junior naturalist and archaeologist will benefit from this book and so might a number of naturalists who neglect domestic animals entirely — as such this is a blow in a good cause. The lack of a bibliography is a drawback. T.M.C.

The Tuatara, Lizards and Frogs of New Zealand by **Richard Sharell.** Pp. 94 with 52 coloured and 16 black and white illustrations. Collins. 1966. 30/–.

The jacket blurb informs us that this is a new kind of nature book, designed for readers of all ages and to form an introduction to one particular group of animals. It certainly is — the text is clear and the illustrations include some fine colour photographs, which come near to being a full coverage of the New Zealand herpetofauna. After this introduction one felt like going much further into the subject.

Mr. Sharell writes clearly and authoritatively and his work should please all of the wide readership for which the book is intended. His addiction to the Tuatara is complete and his chapters on this odd reptile are masterly. If you are keen on any aspect of reptile or amphibian life, or have a birthday present problem, this is a book to consider. The production of the book is Japanese — once again we get a lesson in reasonably priced colour reproduction. One small criticism, in my copy at least, the index of plates is not bound in. I hope this is not general. T.M.C.

A Continent in Danger by **Vincent Serventy.** Pp. 240 with 12 pages of photographs in colour and 12 in monochrome. Andre Deutsch Ltd., London. 45/–.

We read much today about the disappearing wild life in many parts of the world and now it is the turn of Australia to state her case. The author is deeply concerned to find a solution to this difficult problem of conservation and in collecting together material for this book he has received much assistance from naturalists in many parts of the continent.

This book is not intended to furnish a complete account of the animals of Australia but rather to describe those species that are unable to hold their own in a rapidly changing environment. It is stated, for instance, that in less than 200 years about 5% of the Marsupials have been exterminated and about 40% brought to the verge of extinction. In this connection it must be realised that the two species of egg-laying animals, the Monotremes, are confined to Australia as are also most of the known species of pouched animals, the Marsupials. The bird population is also remarkable, ranging from the flightless Emu and the mound building Mallee Fowl to the Bowerbirds and Honeyeaters but many species need protection. The reptiles are well represented by some hundreds of species ranging from crocodiles to small lizards. In the final quarter of the book the author examines the conditions that have brought about such marked changes, before presenting a well thought out plan for action.

This is a timely and excellent book which should be read by all interested in conservation. It should also do much to awaken the authorities to take suitable action while there is still time. E.W.T.

Mice all over, by **Peter Crowcroft.** Pp. 121 with 9 plates and 16 figures. Foulis & Co., 1966. 25/–.

Dr. Crowcroft is already known for his sound investigations and clear writing, so one looked forward with pleasure to his latest work. This book is an account of his study of mice in a disused bomber trainer at a Buffer Depot, an environment which afforded ideal conditions both for the mice and for his own large-scale observations on their lives and habits. It includes detailed results of an exhaustive enquiry into their feeding and breeding habits which may at some future date form the basis for more effective control in relation to food storage. The book can be read with interest both by the naturalist and trained zoologist and the author's manner of writing holds one's attention throughout. E.H.

The Ivory-billed Woodpecker, by **James T. Tanner.** Pp. xii + 111 with 20 photographs, 22 other illustrations and 17 tables, index and bibliography. Dover Publications Inc.; agents, Constable & Co. 16/–.

"The greatest tragedy in nature," says Professor A. A. Allen in the preface of James Tanner's research report (written in 1942), "is the extinction of a species." In 1937, the author began a 21 months study of the Ivory-billed Woodpecker, a species verging on extinction and confined to a few localities in the south-east United States. Mr. Tanner's terms of reference were to discover the necessary facts for planning an effective conservation programme for the species. He found only 22 individuals and 6 of these were in the Singer Tract in the Mississippi Delta. (Further destruction of the specialised habitat took place in the second world war and by 1961 there were only unconfirmed reports of survival.) In 100 pages, the author compresses a wealth of information about the species' history, population ecology, feeding habits and breeding biology. However, the value of the report lies not so much in the knowledge presented but as a model for future conservation of endangered species, a situation conservationists will meet increasingly in the remainder of this century of 'progress'. A.F.G.W.

Travels in North America, by **Peter Kalm,** revised and edited by **Adolph B. Benson.** Pp. xviii + 797 with 20 illustrations and a map. Dover Publications Inc., agents, Constable & Co., 1966. 2 vols. 20/– each.

Peter Kalm, in honour of whom his friend and teacher Linnaeus named *Kalmia*, was sent to North America by the Swedish Academy of Sciences in 1747. He arrived in America the following year and spent two and a half years in travelling through the eastern States from Philadelphia to Boston and visiting Niagara, Montreal and Quebec. The object of his journey was to collect and transmit seeds of trees, herbs and any other useful plants hardy enough to thrive in Sweden. But Kalm's interests and enquiring mind ranged far beyond his profession and the record of his travels with the wealth of observations on all he saw is important for the light which it throws on the America of 1750. It is important also as the first comprehensive account to be published of the plants, birds and animals of Eastern North America. The English translation of his travels appeared in 1770 and the present edition, revised from the original Swedish by the late Professor Benson incorporates new material from diary notes that Kalm never published together with many explanatory footnotes and other supplementary matter. W.A.S.

The Shell Country Alphabet, by **Geoffrey Grigson.** Pp. 320, with 8 colour plates and 72 monochrome photographs. Michael Joseph in association with George Rainbird, 1966. 30/–.

This is a book for the curious in mind. In character a miniature encyclopaedia, there are entries for all manner of subjects, from 'crannogs' and 'cressets' by way of 'lynchets' and 'lychgates' to 'wapentake' and 'winterbournes', as well as more predictable inclusions like 'foot-paths' and 'waterfalls'. The illustrations are excellent, and constitute an original and appropriate selection. In all this is a diverting volume, which amongst naturalists will be appreciated particularly by those with a latent but uninformed interest in such things as archaeological remains and church architecture and decoration. Such persons will find this book genuinely helpful and informative. J.D.L.

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W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

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R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., F.G.S.

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Published by

THE YORKSHIRE NATURALISTS' UNION

The **CHISLETT MEMORIAL LECTURE** will be in Hull on **Saturday, 9th September** at 7 p.m. James Fisher will be the speaker and will show the film 'Wild America'.

PRELIMINARY NOTICE

In conjunction with the Royal Society for the Protection of Birds, Bradford Naturalists' Society is arranging for the R.S.P.B. films 'Lune Valley', 'Ripples in the Reeds' and 'The Call of the Running Tide' to be shown in the Midland Hotel, Bradford on **Friday, 20th October, 1967** at 7.30 p.m.

SPURN BIRD OBSERVATORY

Report for 1966 now available, price 3/6d. post free, from The Warden, Spurn Bird Observatory, KILNSEA, via Patrington, Hull, East Yorkshire.

WANTED. Copies of *The Naturalist* for Jan. — March 1964 and April — June 1964. Will anyone who can supply please forward to The Editor of *The Naturalist*, The University, Leeds 2.

JUL 1967 NATURAL HISTORY

THE DISTRIBUTION OF *ACTAEA SPICATA* L.

P. M. GARNETT and W. A. SLEDGE

The publication in 1962 of the *Atlas of the British Flora* achieved with conspicuous success its object of accurately portraying the distributions of British plants. Some errors and omissions were inevitable however in a work of such magnitude and complexity and though these scarcely affect the overall patterns of distribution which the maps reveal they become evident when the maps are examined at the county rather than the national level. The numerous entries based on records for which no recent confirmation was available repeatedly raise the question of how far these white circles are an indication of extinction or how far they reflect more a lack of recent search than of actual decline. Though the answer is all too often in favour of the first alternative there yet remain a very large number of entries of this kind to which the answer is unknown. The *Atlas* should therefore be regarded by botanists not as an end in itself but as a basis for further field work.

At a meeting of the Botanical Section of the Yorkshire Naturalists' Union in the autumn of 1963 it was agreed that attention should be directed towards a detailed investigation of the distribution of selected Yorkshire species with a view to correcting errors and searching all those stations on which entries in the *Atlas* had been based but for which no recent confirmation had been received. *Actaea spicata* was chosen as the initial species for investigation since it is an almost exclusively Yorkshire plant, is recorded from all five vice-counties and, as indicated in the *Atlas*, half the recorded 10 km. squares were lacking in recent confirmation. West Lancashire was included in the survey since the two adjacent localities there from which *Actaea* is recorded lie very close to the Yorkshire border.

From information received from Dr. Perring it was evident that one black square and three of the fourteen white squares were based on inaccurate allocation of vaguely localised records to wrong squares. On the other hand six additional squares for which *Actaea* records exist were omitted from the *Atlas* map. From four squares marked as lacking post-1930 confirmation, the plant was known with certainty still to be present. At the outset of the survey therefore there were thirteen squares from which confirmation was required though only seven of these were squares so marked in the *Atlas*.

In the course of the survey *Actaea* was seen in every one of the Yorkshire squares in which its presence had already been noted during the field work done in connection with the preparation of the *Atlas* and new stations were recorded in several of these. It is not the purpose of this paper however to add to the records from known squares but to give the results of the investigations of those squares in which recent evidence was lacking prior to the beginning of the survey. The details for each square are set out below and from this information and the accompanying map it will be seen that firm records for *Actaea* in Yorkshire and West Lancashire now cover twenty-four squares and only in three is confirmation still lacking. The corresponding figures in the *Atlas*, after adjustment for errors, are ten and eleven respectively.

In nine squares *Actaea* is, so far as we know, confined to single stations and in two of these to a single plant. The total number of distinct stations in Yorkshire is probably not less than sixty though an accurate estimate is difficult since the boundary between what constitutes one or two stations in the case of colonies which are not far distant from one another, becomes arbitrary.

West Lancashire v.c. 60

34/68 Wheldon and Wilson's (135, 1907) records for Ease Gill and Leck Fell are the basis of the *Atlas* entry. Seen by W.A.S. and Dr. G. A. Nelson on 11 June, 1964 in fair quantity in limestone pavement above Ease Gill.

34/67 Not marked in the *Atlas*, but Navel Pot on Leck Fell whence it was recorded in 1888 and of which there is a photograph in Wheldon and Wilson's *Flora* (p. 13) falls in this square though less than half a mile from the Ease Gill site. The plant grows, as stated in the *Flora*, on an inaccessible rock ledge where it is difficult to see unless in flower and not until a third visit had been made on 29 May, 1965, with binoculars, was it possible for W.A.S. to confirm the record with certainty.

East Yorks. v.c. 61

44/76 Recorded from Howsham Wood (now mostly felled) by Robinson (1902), and from Firby Wood and 'woods near Kirkham Abbey' in *Nat.*, 366, 1920. Refound in the wood north of Kirkham Abbey, about twenty plants in four patches, by Miss Crackles on 23 May, 1964.

44/85 Not marked in the *Atlas*, but recorded from Millington Spring by J. H. Evers in 1928. Seen at Millington Wood by Miss Crackles in May, 1964; two patches on the east facing slope and two on the west facing slope, about 30 plants in all. Dr. Nelson has known *Actaea* in the wood at Great Givendale for many years and showed it to W.A.S. in 1963. Also at Beckhead Wood *fide* G. A. Nelson.

44/96 Not marked in the *Atlas* but recorded in Robinson (1902) for Bessingdale near Sledmere. Searched for here by Miss Crackles in 1964 but with no success. Much tree felling has been done in this area since Robinson's days.

54/07 Not marked in the *Atlas*. Found in an ash wood on Folkton Brow east of the Hunmanby-Folkton road by Professor Good about ten years ago and seen here by Miss Crackles and P.M.G. in May, 1964. This locality probably holds more *Actaea* than any other single station in the country, the plant dominating the ground flora over considerable areas.

North-East Yorks. v.c. 62

44/78 The entry for this square is based on a specimen in the British Museum herbarium collected at Kildholm by E. Dawson in 1849. Refound near Kildholm by P.M.G., about 35 plants on a steep limestone bank above the river, on 3 May, 1965.

44/88 Recorded for Thornton Dale and Givendale in Walsh and Rimmington (1953). Much felling and replanting has been carried out by the Forestry Commission in this area and former stations for *Actaea* have doubtless suffered in consequence; but the foresters K. Green and G. Simpson report the plant as still surviving in two places in 44/8586, one plant in one spot and three in another. It was seen in the latter station during the Y.N.U. excursion in 1966. At Oxdale between Ebberston and Allerston, W. G. Bramley saw about a dozen plants and two more in the plantation to the east towards Kirkdale, in June, 1965. It was seen again at Oxdale in Sept., 1965 by P.M.G. who found another colony of six plants a little further west and six or eight scattered plants further on, on the Givendale side of the ridge.

44/77 The station at Hildenley Wood near Malton whence *Actaea* was recorded in Baines' *Flora* (1840) is the only one known in this square. Seen there — about 30 plants — by P.M.G. in May, 1964.

South-West Yorks. v.c. 63

(44/11 Delete this square. The record refers to the following.)

44/21 The entry in the *Atlas* is based on Leyland's 1812 record for Liley Wood near Mirfield. The Upper Whitley locality on which the entry in the *Atlas* for 44/11 was based refers unquestionably to the same station. The *Actaea* was said to grow 'in small quantity in one corner of the wood' (Davis & Lees, 351, 1878) and 'nearest the farm house above the edge of the wood' (Lees, 127, 1888). It has not been seen there within living memory. Eric Thompson and W.A.S. searched Liley Wood in May, 1964, both the corner near the farm house above the edge of the wood and much of the rest of the wood, but without success; and E.T. has paid further unsuccessful visits. There does not seem in our opinion any doubt that *Actaea* must originally have been introduced here as indeed Lees considered in the earlier work quoted above. The wood lies on the Coal Measures and none of the usual associates of *Actaea* are present.

Mid-West Yorks. v.c. 64

34/95 Not marked in the *Atlas* but recorded from Flasby by Rotheray (1900) and there is a specimen from there in Herb. W.A.S. gathered by F. Ashwell in 1917. Repeated search during this survey has failed to reveal the whereabouts of the plant.

34/97 It is ironical that this square should be marked in the *Atlas* with a white circle since it has the largest concentration of *Actaea* stations of any 10 km. square in the country. It is recorded at Kirk Gill, Bouther Gill, Raisghyll, Water Gill, Cray Gill, Firth Gill, scars above Starbotton, Kettlewell, Buckden, Cowside Beck and Scoska Wood between Arncliffe and Litton. It was seen by W.A.S. in Kirk Gill in 1964 and in Strans Gill, Hubberholme (*Nat.*, 145, 1965) in 1965, and is doubtless still present in all the other gills.

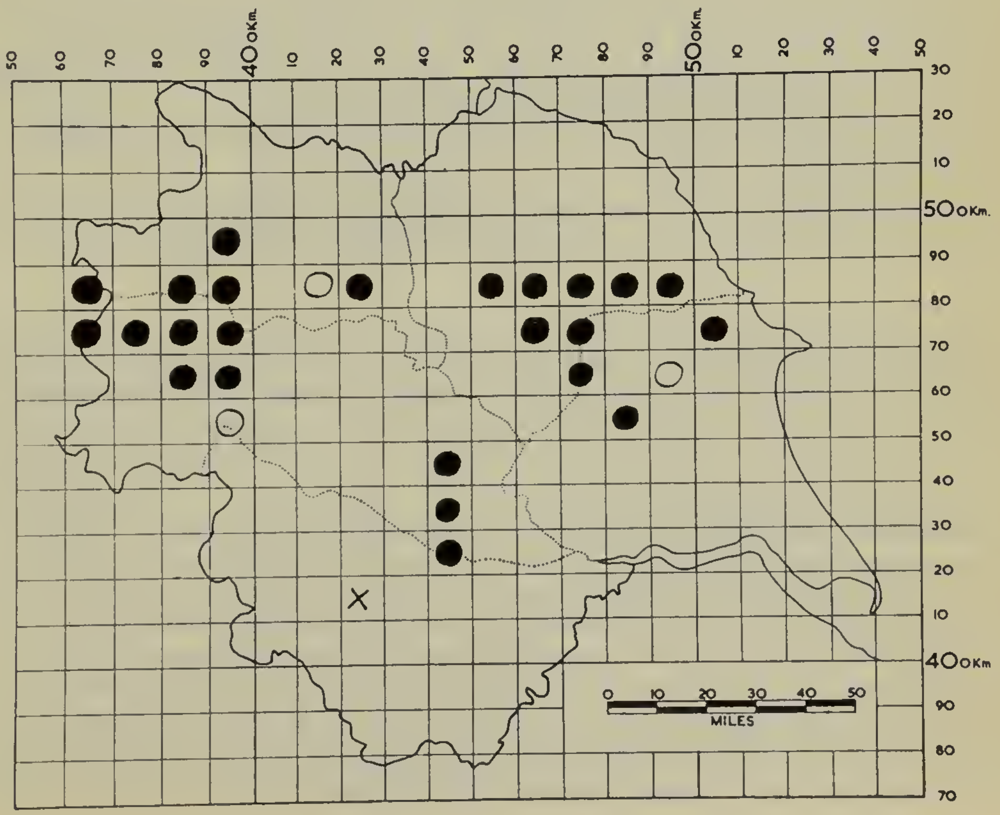
34/88 Not marked in the *Atlas* but recorded many years ago by C. A. Cheetham and J. Beanland in Deepdale, Langstrothdale. W.A.S. failed to find it there in 1964 but P.M.G. found a single non-flowering plant a day or two later. The station is in the extreme south-east corner of the square, the rest of which is unlikely to have any suitable habitats.

(44/26 The record in the *Atlas* is based on an undated specimen in 'Hb. J.C.M.' purporting to come from Fountains Abbey. Since there is no mention of *Actaea* there in Brunton's catalogue of Ripon plants (1806) or in Slater's *Flora of Ripon* (1883) and no other record for the species is known from this much botanised area, we do not accept the accuracy of this locality.)

(44/37 This entry is based on a specimen in the Cambridge Herbarium localised 'Nr. Ripon. H. H. Slater, June, 1880'. As the only station near Ripon cited by Slater (1883) is 'Not far from Masham' the specimen evidently came from the High Mains, Masham locality, which is in 44/28. It may well be that the 'Fountains Abbey' specimen referred to in the preceding paragraph also came from High Mains, Masham for both localities are near Ripon.)

44/42 The entry in the *Atlas* is based on the record in Lees (1888) for Allerton Bywater and Kippax where *Actaea* is said to have been plentiful in 1868. In 1958 these woods were totally destroyed in opencast coalmining operations and it is inconceivable that *Actaea* could have survived the holocaust. But a single plant was found by P.M.G. in a new locality near Ledsham in May, 1964.

(44/53 Delete this square. The record on which the entry in the *Atlas* was based refers to Renshaw Wood near Towton which is on the boundary of 44/43 and 44/44 in both of which *Actaea* has other stations.)



North-West Yorks. v.c. 65

34/99 The entry for this square is based on the record in Baker (1863) for Whitfield Gill, Askrigg. Five plants were seen there on the Y.N.U. Whitsuntide excursion in 1963, (*Nat.*, 136, 1963). It is not known to grow elsewhere in the square.

(34/89 Reported from one of the 'Buttertubs' by J. Rogerson in 1963 (*Nat.*, 28, 1964) but neither P.M.G. nor Mr. Rogerson himself were able, independently, to verify the sight record in 1965. Since it is hard to believe that *Actaea* could have escaped detection in such a much visited place by all earlier botanists, we feel unable to accept the unconfirmed report as a valid record.)

34/98 Not marked in the *Atlas* though recorded from Back Gill on the occasion of the Y.N.U. excursion to Bishopdale in 1922 (*Nat.*, 387, 1922). Refound there by P.M.G. in June, 1964; also in Foss Gill in June, 1965, growing by the lips of waterfalls in both gills.

44/18 The entry in the *Atlas* is based on a specimen in the Cambridge Herbarium localised 'Deep Gill, Jervaulx, June, 1883. L.M.' Two short visits by P.M.G. and Miss Rob failed to produce confirmation. Much of the ground is ecologically unsuited to *Actaea* though some possible habitats do exist. Further search is still needed before it can safely be said to have gone from this locality.

44/28 Seen by W.A.S. in 1948 in the station at High Mains near Masham whence it is recorded in Baker (1863) and confirmed there by Mrs. J. Holloway and Miss D. Walker in May, 1964. The only other recorded locality in this square, also cited in Baker's *Flora*, is at Thornton Watlass where Miss Walker has searched for it without success.

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POSTSCRIPT

This paper was completed more than a year ago. I suggested to Mr. Garnett that he should add some notes on the ecology of *Actaea* and this he agreed to do though the matter was deferred since there was no immediate prospect of publication. It is unfortunate that his notes were never put together for not only was he an enthusiastic and most diligent searcher who devoted most of his spare time in 1964 and 1965 to the *Actaea* survey, but his knowledge of the precise habitat requirements of the plant and its most characteristically associated species was unrivalled. It was this exact ecological knowledge which enabled him to verify the Deepdale record where I and three companions had all missed it a few days previously; and which took him to Foss Gill in Bishopdale in the belief that the plant *ought* to be there — and to prove his belief correct. The field work in connection with this survey owes more to 'Pip' Garnett than anyone. He derived great pleasure from the investigation and was an ideal collaborator since he was never deterred by failure. If the area was likely ground he would return repeatedly and continue the search until all possible places had been methodically explored. By his death the Botanical Section of the Union has lost one of its most active and reliable workers. All who knew him will be saddened by his death and those who knew him best will feel the loss most. W.A.S.

F. A. LEES' LINCOLNSHIRE MOSS RECORDS

MARK R. D. SEAWARD

Yorkshire naturalists will be familiar with the botanical work of Dr. F. Arnold Lees (1847–1921) in his native county, but perhaps less familiar with his contributions to the flora of Lincolnshire. As a result of his botanical labours in Lincolnshire, undertaken during his short medical practice based at Market Rasen (between April, 1877 and May, 1879 according to Lees' notebooks, but between April, 1877 and September, 1879 according to *The Naturalist*, 1896, 12), he was able to publish his *Outline Flora of Lincolnshire* which covers flowering-plants, ferns, liverworts, mosses, lichens, fungi and fresh-water algae on a North/South Lincolnshire distributional basis. This publication proved to be the foundation for botanical studies in subsequent years. It is particularly interesting to note that this *Outline Flora*, published in 1892, has not been superseded by a comprehensive 'Flora' for the county, although check-lists for certain groups have been published.

His lists are of particular interest to the bryologist and lichenologist; they have formed a valuable basis for Lincolnshire cryptogamic work, especially in the cases of the liverwort (Stow, 1902), moss (Allison, 1931, 1932) and lichen (Seaward, 1966) check-lists.

His published works relating to the Lincolnshire cryptogamic flora appeared mainly in *The Botanical Locality Record Club Reports* for 1878 and 1879–80, and in *The Naturalist* and *Journal of Botany* between the years 1877 and 1900. Brief references also appear in the *Flora of West Yorkshire* (Lees, 1888) and in the *Botanical Transactions of the Yorkshire Naturalists' Union* (Vol. 1, 1877–91). His notebooks, some of which belong to Dr. W. A. Sledge, constitute a further valuable source of records along with his personal copy of the *Outline Flora*, which is interleaved and annotated in his own hand and now belongs to the Botany School, Cambridge University.

Although moss herbarium material, which is fairly representative of Lees' many recordings, still exists, the author has been unable to locate material representative of the other cryptogamic groups, other than specimens of the lichen *Cetraria islandica* (L.) Ach. (from Market Rasen, 1877: *The Naturalist*, 1878, 97–102) in the herbaria of the British Museum and South London Botanical Institute.

The following Lincolnshire mosses are to be found in the City and County Museum Herbarium, Lincoln, unless otherwise stated. The nomenclature and reference numbers are according to Warburg (1963), and in each instance the locality and date of collection are indicated. In many cases a reference to a published source is given. The following abbreviations are used:

B.L.R.C.Rep.	The Botanical Locality Record Club Report.
Herb. Bradford	Herbarium, Cartwright Memorial Hall, Bradford.
Herb. Brit. Mus.	Herbarium, Cryptogamic Department, British Museum (Natural History).
Herb. Seaward	Herbarium, M. R. D. Seaward.
J. Bot.	*Journal of Botany.*
Nat.	*The Naturalist.*

SPHAGNA

1/1 *Sphagnum palustre* L., Osgodby Moor, 1878.
1/3 *S. papillosum* Lindb., Linwood, Nov., 1878.
1/5 *S. compactum* DC., Linwood, July and Aug., 1878.
1/17 *S. cuspidatum* Ehrh., Linwood, March, 1879.

TRUE MOSSES

3/2 *Atrichum undulatum* (Hedw.) P. Beauv., Rasen, 1878 (Herb. Seaward).
5/2 *Polytrichum aloides* Hedw., $1\frac{1}{2}$ mile north of Rasen, 1878.
5/3 *P. urnigerum* Hedw., 'Banks by old pits on left of Caistor Road, $1\frac{1}{4}$ mile north of Rasen' (*B.L.R.C. Rep.*, 1878, 40), March, 1879.
5/6 *P. piliferum* Hedw., Linwood, 1878.
5/7 *P. juniperinum* Hedw., Rasen, 1878.
5/11 *P. commune* Hedw., Linwood, 1878.
8/4 *Fissidens bryoides* Hedw., Rasen, 1878.
8/15 *F. taxifolius* Hedw., Rasen, 1878.
15/1 *Ceratodon purpureus* (Hedw.) Brid., Rasen, 1878.

22/4 *Dicranella varia* (Hedw.) Schimp., Rasen, 1878.
22/9 *D. heteromalla* (Hedw.) Schimp., Rasen, 1879.
27/1 *Dicranoweissia cirrata* (Hedw.) Lindb., Tealby, 1878.
29/11 *Dicranum majus* Sm., Linwood, 1878.
29/12 *D. bonjeani* De Not., Linwood, 1877 and Rasen, 1878.
29/13 *D. scoparium* Hedw., Linwood, 1878.
31/4 *Campylopus fragilis* (Brid.) B., S. & G., nr. Usselby, 1878.
31/6 *C. flexuosus* (Hedw.). Brid., Linwood, 1878.
33/1 *Leucobryum glaucum* (Hedw.) Schimp., Rasen, 1878.
35/1 *Tortula ruralis* (Hedw.) Crome, 1½ mile north of Rasen, 1878.
35/4 *T. intermedia* (Brid.) Berk., Claxby Wood, 1878.
35/12 *T. muralis* Hedw., Rasen, 1878.
38/1 *Pterygoneurum ovatum* (Hedw.) Dix., Kirton Lindsey, Feb., 1878.
40/4 *Pottia intermedia* (Turn.) Fürnr., Rasen, Feb., 1878.
40/5 *P. truncata* (Hedw.) Fürnr., Rasen, March, 1879.
43/1 *Cinclidotus fontinaloides* (Hedw.) P. Beauv., Tealby, 1877 (Herb. Seaward).
44/2 *Barbula unguiculata* Hedw., Rasen, 1878.
44/20 *B. recurvirostra* Hedw., Tealby, 1878.
52/1 *Weissia controversa* Hedw., Rasen, March, 1878.
55/2 *Grimmia apocarpa* Hedw., Claxby, 1878.
55/20 *G. pulvinata* (Hedw.) Sm., Claxby, 1878.
58/1 *Funaria hygrometrica* Hedw., Rasen, 1878.
69/1 *Tetraphis pellucida* Hedw., Rasen, 1878.
73/5 *Pohlia nutans* (Hedw.) Lindb., Linwood, 1878.
77/23 *Bryum caespiticium* Hedw., Claxby Wood, 1878.
77/26 *B. bicolor* Dicks. (incorrectly labelled *B. erythrocarpum* Schwaegr.), Linwood, 1878 (Herb. Seaward).
77/37 *B. capillare* Hedw., Claxby Wood, 1878.
79/1 *Mnium hornum* Hedw., Rasen, 1878.
79/4 *M. marginatum* (With.) P. Beauv., Tealby Glen, 1878.
79/9 *M. longirostrum* Brid., Rasen, 1878.
79/13 *M. undulatum* Hedw., Rasen, 1878.
79/14 *M. punctatum* Hedw., Rasen, 1878.
81/1 *Aulacomnium palustre* (Hedw.) Schwaegr., Linwood, 1878 (Herb. Seaward).
81/3 *A. androgynum* (Hedw.) Schwaegr., Tealby, 1878.
87/2 *Bartramia pomiformis* Hedw., Between Rasen and Legsby, May, 1878 (Herb. Seaward).
90/2 *Philonotis fontana* (Hedw.) Brid., Wrawby Moor, 1878 (Herb. Seaward).
91/1 *Breutelia chrysocoma* (Hedw.) Lindb., 'In small quantity, and barren, amongst *Sphagnum rigidum* (= *S. compactum*) and *subsecundum*, by the great ditch on Linwood Warren' (*B.L.R.C. Rep.*, 1878, 39); 'Growing in small quantity amongst *Sphagnum* to east of great ditch. Tree marked near spot' (Lees' notebook no. 2, 27/4/1879); 'Relic of a boreal flora' (*B.L.R.C. Rep.*, 1878, 20). Extinct in the late eighties (see: *Nat.*, 1900, 233). Linwood, July, 1878.
98/2 *Orthotrichum anomalum* Hedw., Claxby, 1878.
98/5 *O. affine* Brid., Stainton-le-Vale, 1878.
99/3 *Ulota crispa* (Hedw.) Brid., Wickenby Holt, 1878 and as var. *intermedia* Schimp., Linwood, 1878.
100/1 *Fontinalis antipyretica* Hedw., Bishopbridge, 1878.
101/1 *Climacium dendroides* (Hedw.) Web. & Mohr, Rasen, 1878.
104/1 *Leucodon sciuroides* (Hedw.) Schwaegr., 'Wall on top side Claxby Wood' (*B.L.R.C. Rep.*, 1878, 40), 1878.
109/4 *Neckera complanata* (Hedw.) Hüben, Rasen, 1878.
110/1 *Omalia trichomanoides* (Hedw.) B., S. & G., Wickenby Holt, Jan., 1879.
111/1 *Thamnium alopecurum* (Hedw.) B., S. & G., Linwood, March, 1878.
122/3 *Anomodon viticulosus* (Hedw.) Hook. & Tayl., 'Stainton-le-Vale, in small quantity' (*B.L.R.C. Rep.*, 1878, 40), 1878.
123/3 *Thuidium tamariscinum* (Hedw.) B., S. & G., Rasen, 1878.
125/1 *Cratoneuron filicinum* (Hedw.) Spruce, Between Rasen and Legsby, 1878.
126/1 *Campylium stellatum* (Hedw.) J. Lange & C. Jens., Fossdyke, 1½ mile above Lincoln, Aug., 1878 (Herb. Bradford); Barnetby Junction, Aug., 1878 (Herb. Bradford) and 1878 (Herb. Lincoln).

127/1 *Leptodictyum riparium* (Hedw.) Warnst., Rasen, 1878.

129/1 *Amblystegium serpens* (Hedw.) B., S. & G., Rasen, 1878.

134/6 *Acrocladium cuspidatum* (Hedw.) Lindb., Rasen, 1878.

135/1 *Isothecium myurum* Brid., Linwood, 1878.

135/2 *I. myosuroides* Brid., Stainton-le-Vale, 1878.

137/1 *Camptothecium sericeum* (Hedw.) Kindb., Claxby, 1878.

137/2 *C. lutescens* (Hedw.) B., S. & G., Kirton Lindsey, 1878.

138/2 *Brachythecium glareosum* (Spruce) B., S. & G., 'Ditch bank of fir wood on the Caistor Road, 1½ mile from Rasen' (*B.L.R.C. Rep.*, 1878, 40), 1878.

138/4 *B. salebrosum* (Web. & Mohr) B., S. & G., Rasen, 1877 (Herb. Brit. Mus.); On bank, right-hand side of highroad a mile out of Rasen towards Tealby, Dec., 1877 (Herb. Brit. Mus.); Between Tealby and Rasen, 1877 (Herb. Seaward). See: *Nat.*, 1878, 97–102 and *J. Bot.*, *17*, 359–60, (1879).

138/6 *B. rutabulum* (Hedw.) B., S. & G., Rasen, 1878.

138/11 *B. velutinum* (Hedw.) B., S. & G., Rasen, March, 1879.

138/12 *B. populeum* (Hedw.) B., S. & G., Rasen, 1878.

138/13 *B. plumosum* (Hedw.) B., S. & G., Rasen, 1878.

140/3 *Cirriphyllum crassinervium* (Tayl.) Loeske & Fleisch., Tealby, 1878.

141/1 *Eurhynchium striatum* (Hedw.) Schimp., Wickenby Holt, Feb., 1879 and Legsby Wood, 1878 (Herb. Lincoln); Open ditch banks, Legsby Road, nr. Rasen, *c. fr.*, Dec., 1877 (Herb. Brit. Mus.); Legsby Woods, no date (Herb. Bradford). The material collected from Legsby and named *E. striatulum* B. & S. (*B.L.R.C. Rep.*, 1878, 41) proved to be *E. striatum* on subsequent examination (basal areolation not right and the nerve not strong enough for the former). 'Its most striking feature is its beautiful deep-green colour, its short arcuate branches, and its squarrose leaves, more crowded on the stem and more acuminate than in *striatum*; and too broad, too little attenuate at the point and too strongly serrated and striated for *striatulum*. I propose to style it *arcuatum* — as a variety of *striatum*' (*B.L.R.C. Rep.*, 1879–80, 92).

141/4 *E. praelongum* (Hedw.) Hobk., Rasen, 1878.

141/5 *E. swartzii* (Turn.) Curn., Rasen, 1878.

141/10 *E. murale* (Hedw.) Milde, ½ mile east of Rasen, 1878.

141/11 *E. confertum* (Dicks.) Milde, Middle Rasen, 1878.

142/4 *Rhynchostegiella tenella* (Dicks.) Limpr., Linwood, April, 1879.

146/1 *Pseudoscleropodium purum* (Hedw.) Fleisch., 'Common, fruiting 1878–9' (*B.L.R.C. Rep.*, 1878, 41), Osgodby Plantation, March, 1879.

147/1 *Pleurozium schreberi* (Brid.) Mitt., Rasen, 1878.

148/4 *Isopterygium elegans* (Hook.) Lindb., Tealby, 1878.

149/4 *Plagiothecium denticulatum* (Hedw.) B., S. & G. var. *denticulatum*, Rasen, 1878 (Herb. Seaward).

149/11 *P. sylvaticum* (Brid.) B., S. & G., Rasen, 1878 and Linwood, 1878 (Herb. Seaward).

149/12 *P. undulatum* (Hedw.) B., S. & G., Rasen, 1878 (Herb. Seaward).

154/1 *Hypnum cupressiforme*, Hedw., var. *cupressiforme*, Rasen, 1878; var. *resupinatum* (Wils.) Schimp., Rasen, 1878.

156/1 *Ctenidium molluscum* (Hedw.) Mitt., Claxby Wood, 1878.

160/1 *Rhytidiadelphus triquetrus* (Hedw.) Warnst., Rasen, 1878.

160/2 *R. squarrosus* (Hedw.) Warnst., Rasen, 1878.

160/3 *R. loreus* (Hedw.) Warnst., 'In one spot in fir wood on Walesby Road, nr. Rasen, amongst *Polytrichum* and *Cetraria islandica*, clearly dying out' (*B.L.R.C. Rep.*, 1878, 41), nr. Rasen, 1877.

161/4 *Hylocomium splendens* (Hedw.) B., S. & G., Between Rasen and Tealby, 1878.

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FIELD NOTE

Birds and Anglers

Bird ringers who catch young Lapwings frequently find them hobbled with wool or hair. Sometimes dead ones are found but many live and grow. I found a well-feathered juvenile with its legs secured by a rope of hair from a white horse which was pensioned off in that particular field. The skin had grown almost over the hair. On being released if flew for the first time. In Scotland where Oystercatchers are commoner inland their young face similar risks.

There is another hazard which both adult and young birds must face where people fish. (There are more fishing licences issued annually in England than the number of all the people who attend football matches on a Saturday afternoon.) To-day many lines and casts are made of nylon which does not rot away. This strong very fine line caught in trees or waterweeds or thrown away on the bank is a serious menace. If the old line were cut into small pieces before being discarded it would be almost harmless. Last September the Vicar's children arrived with a Herring Gull which had been in a field near the river for a few days and did not fly away with the others. I found that a six or seven yard length of nylon line with four very large lead shot and a half inch hook was securely wrapped round its wings. When this was cut away it bit the boy who was holding it and flew off.

Mr. Walter Flesher reports recently finding three different birds near the riverside at Burley-in-Wharfedale. The first was a dead Black-headed Gull with a fish hook in its throat and a length of nylon line round its body and wings. Next was a Moorhen badly tangled up in a length of nylon thread and unable to get away as the hook and line were caught up in the undergrowth. The third — on Tuesday, 25th April — was a Sandpiper that had swallowed a fish hook with a length of nylon line caught up in a branch. The two latter were freed of the lines and released. All we could do with the Sandpiper was cut the line from as far inside its beak as could be reached with small pointed scissors, because it had completely swallowed the hook, which I assume would have a maggot on it.

C. G. BOOTH

CHEMICALS AND WILDLIFE

Following the Symposium on "Chemicals and the Land" held at York in April 1965, the Askham Bryan Group was set up for the purpose of collecting information from every available source concerning the effects — harmful or otherwise — of chemicals, antibiotics, hormones and additives on the land, animals and humans. The collection of such information will enable the Group to direct its attention to any problems arising and to assist in allaying fears or pursuing enquiries.

To enable the Group to have the fullest information available, members are urged to send any reports or observations they may have on both actual or suspected effects to: The Secretary, The Askham Bryan Group, Cliftonfield, Shipton Road, York.

NOTES ON THE MORPHOLOGY AND TAXONOMY OF THREE HYDRAS FROM A RHEOCRENE SPRING AT ASHWELL (HERTFORDSHIRE)

IAN R. BALL

The freshwater hydras of Great Britain are poorly known and apart from the synopsis of Ewer (1948) there is no recent critical monograph. When, therefore, during a general survey of the macroinvertebrates of extensive rheocrene springs at Ashwell in Hertfordshire three species of hydra were found, the opportunity was taken to examine these more thoroughly. Although the observations are in certain respects incomplete two of the species show peculiarities which warrant the account given here. Further, in view of the fact that a complete description of *Chlorohydra viridissima* has never been published it seems sensible to rectify this now that complete taxonomic data are available from a single population. Investigation of the other two species will continue as and when both material and time are available.

The following species of hydras have been definitely recorded from Britain. The more commonly encountered synonyms are also listed.

GENUS *Chlorohydra* SCHULZE 1917

(i) *Chlorohydra viridissima* (Pallas 1766)
    syn. *Hydra polypus* L. in part
        H. viridis L. 1767

GENUS *Hydra* LINNAEUS 1758
syn. *Pelmatohydra* Schulze 1917

(ii) *Hydra oligactis* Pallas 1766
    syn. *Hydra polypus* L. in part
        H. fusca L. 1767
        Pelmatohydra oligactis (Pallas) sensu Schulze 1917

(iii) *Hydra vulgaris* Pallas 1766
    syn. *Hydra polypus* L. in part
        H. grisea L. 1767

(iv) *Hydra attenuata* Pallas 1766
    syn. *Hydra polypus* L. in part
        H. pallens L. 1767

The name *Hydra polypus* L. is a nomenclatorial problem. Linnaeus (1758) grouped all hydras under this single name and it was left to Pallas (1766) to describe and name the four species listed above. Linnaeus (1767) then recognised these species but invalidly introduced new names for them. Under the present rules of the International Code of Zoological Nomenclature there is no reason why the name *Hydra polypus* L. should not be retained for one of the species recognised by Pallas. However, I do not think it would be wise to attempt to reintroduce the original Linnaean name now that the names of Pallas are so firmly established. Brauer's (1909) reintroduction of the name *H. polypus* L. for an entirely new species (now known as *H. braueri* Bedot 1912) is generally, and correctly, regarded as invalid.

The precise identification of unknown hydras is a complicated procedure. It necessitates the culturing of the unknown specimens as the sexual organs and embryotheca (shell formed round the fertilised egg) must be examined. Information on the manner of asexual reproduction, which takes place by budding, is also required. Hyman (1929) lists the following characters as being of taxonomic importance:

(i) Shape, size, and internal structure of the nematocysts or stinging cells.
(ii) Shape of the testes.
(iii) Form of the embryotheca.
(iv) The separation or non-separation of the sexes.
(v) The manner of origin of the tentacles on the bud.

Hyman (*op. cit.*) regards the general appearance or habit of the animal as of value only when determined on healthy laboratory-cultured specimens. She recommends that colour should not be depended upon.

In view of the taxonomic importance of the nematocysts it seems worthwhile to summarise briefly the main features of the different types found in hydras, and to draw attention to their old and modern names, as both are encountered in the literature.

The names and functions of the four types of nematocysts found in hydras are as follows (partly after Hyman, 1940):—

Modern Name	*Previous Name*	*General Appearance*	*Function*
Stenotele	Penetrant	Large, pyriform, with an armed thread	Penetration and Paralysis of prey
Holotrichous Isorhiza	Streptoline Glutinant	Oval or cylindrical, with a slender thread characteristically coiled	Defence
Atrichous Isorhiza	Stereoline Glutinant	Small, oval, with a slender thread	Aids in locomotion
Desmoneme	Volvent	Small, spheroid, with a stout unarmed thread	Grasps bristles and appendages of prey

In the account of the three hydras which follows only the minimum of habitat data will be given. A fairly detailed description of the springs at Ashwell has been published elsewhere (Ball, 1964).

All the specimens were examined in the living state. Selected animals were then squashed under a coverslip and the nematocysts immediately observed with the aid of an oil immersion lens. Measurements were made using an ocular micrometer. Data on reproduction were derived from specimens cultured indoors in small plastic aquaria. Some specimens were killed in Steinmann's fluid and preserved in 70% alcohol for future reference.

Genus CHLOROHYDRA P. Schulze 1917

This genus was erected by Schulze for those hydras whose colour was green owing to the presence of symbiotic zoochlorellae, and whose embryotheca was composed of polygonal plates without spines. Up to the time of Ewer's (1948) review only one species, *Chlorohydra viridissima,* was known, and this is still the only described European representative of the genus. Ewer (*op. cit.*) considered the presence of symbiotic algae a poor generic character but recommended the retention of the genus as the embryotheca is so different from that of any other freshwater hydra. However, Forrest (1959) has described from America a new species, *Chlorohydra hadleyi*, in which the embryotheca is quite different from that of the older species. The main case for the retention of the genus *Chlorohydra* is thereby invalidated, but Forrest preferred to retain it pending further taxonomic investigation. Her suggestion is followed here.

CHLOROHYDRA VIRIDISSIMA (Pallas 1766)

Schulze never monographed the 'green hydras' and until comparatively recently no precise descriptions of European specimens of this cosmopolitan species had been published. The most detailed work has emanated from Belgium. Brien and Reniers-Decoen (1950) give a detailed account of the reproduction and Semal-van Gansen (1954) has published a study of the structure of the nematocysts of this and other species. Nonetheless, neither of these publications attempts to describe completely specimens from a single locality, and nobody appears to have described taxonomically British specimens of the species. A complete description of material from Ashwell now follows.

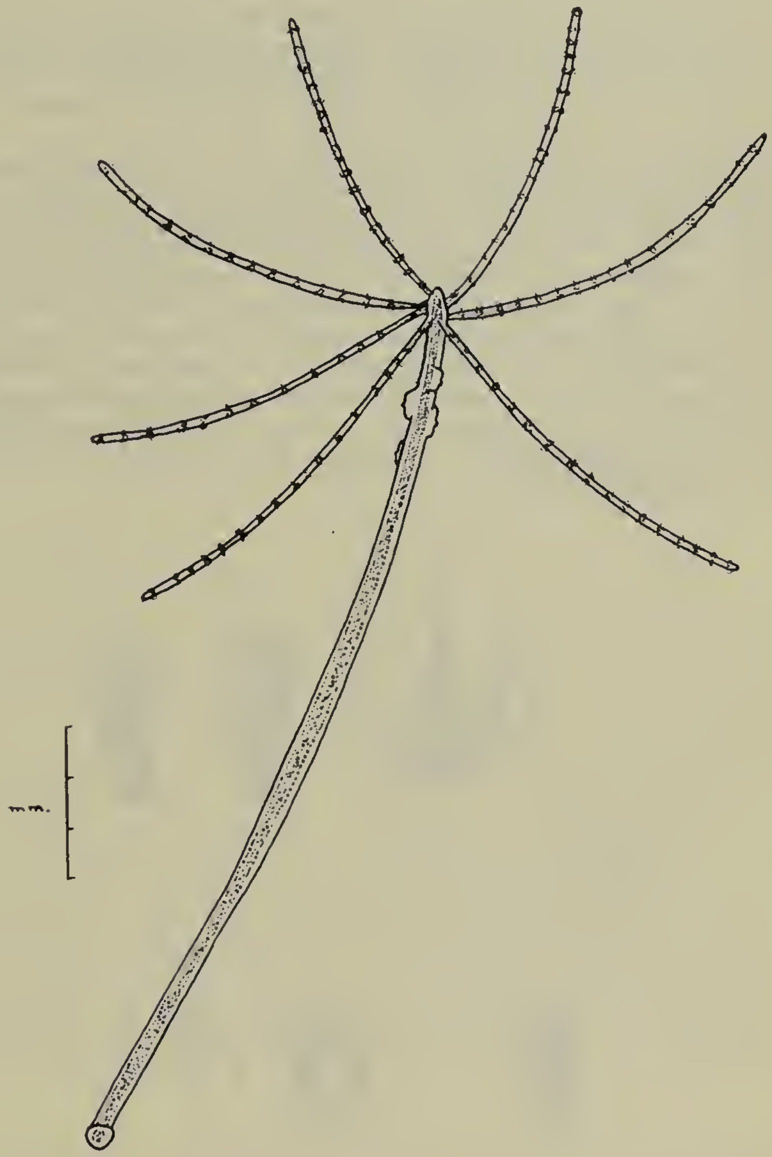
Habit. The column is up to 20 mm. long but sexually mature specimens only 5 mm. long have been found. The tentacles, which never exceed the length of the column, are usually seven in number, occasionally six or eight, rarely up to eleven, and more rarely four or five. In a fully extended animal the column is exceedingly slender and there is no narrowing to form a stalk region. The hypostome is large, conical, and projects upwards from the tentacles which surround it. The tentacles are held erect, usually slightly curved upwards, never drooping at the ends. (Fig. 1).

The colour is a bright green resulting from the presence of zoochlorellae in the endoderm. Evidently not all the endoderm cells are affected as under the microscope the green colouration appears reticular. A few specimens were very pale in colour.

Occasionally specimens were found which were heavily infected with a motile parasitic ciliate. This ciliate, not *Trichodina,* was not confined to the outer surface of the column and tentacles but also swam freely within the enteron of the hydra. Large numbers of these ciliates congregated around waste matter discharged via the hypostome.

Nematocysts. The form of the various nematocysts is given in Figure 2, and their size is as follows:

Stenoteles	8.1 — 12.6μ × 6.8 — 9.9μ	mean 10.8μ × 8.4μ
Holotrichous Isorhizas	6.4 — 12.6μ × 2.6 — 4.4μ	mean 8.8μ × 3.4μ
Atrichous Isorhizas	4.5 — 7.2μ × 2.6 — 3.6μ	mean 5.7μ × 3.2μ
Desmonemes	3.6 — 5.4μ × 2.7 — 4.5μ	mean 4.7μ × 3.7μ



Chlorohydra viridissima (Pallas)

Fig. 1 Extended animal with ripe testes.

Only Semal-van Gansen (1954) has previously provided data on the size of the nematocysts of this species, and these are in the form of scale diagrams. Measurement of these gives the following:

Stenoteles	15.0μ × 10.0μ
Holotrichous Isorhizas	12.6μ × 3.4μ
Atrichous Isorhizas	7.6μ × 3.3μ
Desmonemes	6.3μ × 5.0μ

In general, therefore, the nematocysts of the Ashwell specimens are much smaller than those of the continental specimens. They correspond more closely in size to those of *Ch. hadleyi* Forrest.

The stenoteles are broadly pyriform but at the magnification used the details of the coiling of the thread could not be discerned. The desmonemes, which contain a singly coiled stout thread, are almost spherical but with a slight point at the thread attachment end. The atrichous isorhizas are roughly cylindrical, slightly pointed at each end, and contain a fairly stout thread irregularly coiled longitudinally. The form of the holotrichous isorhizas is especially interesting. According to Schulze (1927) and Ewer (1948) these are of a characteristic shape with the proximal end narrowed. Schulze described them as 'slipper-shaped'. The thread was said to lie in three or four transverse or oblique coils in the broad distal part of the nematocyst and then to coil rather irregularly in the narrower part. Many of the holotrichous isorhizas from Ashwell specimens conform to this description, but a large proportion of them do not show the 'slipper' shape (Fig. 2). Usually the first three or four coils of the thread were oblique and the remainder irregularly coiled. A few of these nematocysts had the oblique coils at their narrow end. The holotrichous isorhiza of *Ch. viridissima* as drawn by Semal-van Gansen (1954) is not particularly 'slipper' shaped and it seems reasonable to assume that this is not as constant a character as Schulze believed. Nonetheless, such shaped holotrichous isorhizas are not known from any other hydra. In a brief description of an Australian *Chlorohydra*, probably *Ch. viridissima*, Brereton (1956) reports that the holotrichous isorhizas did not possess the characteristic narrowing at their proximal end.

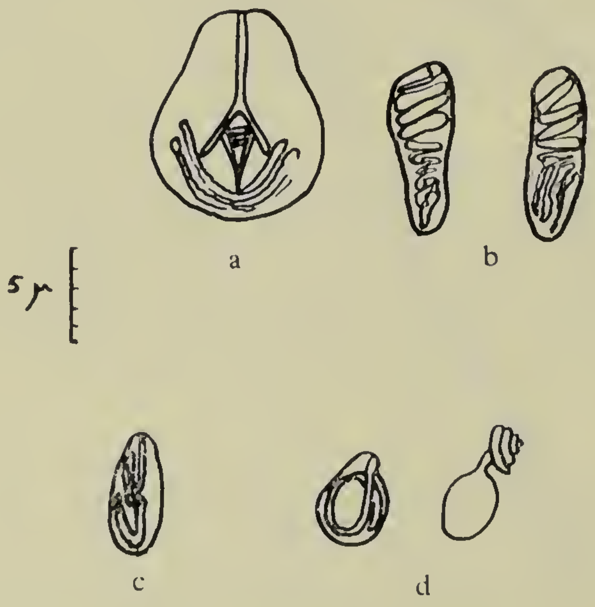
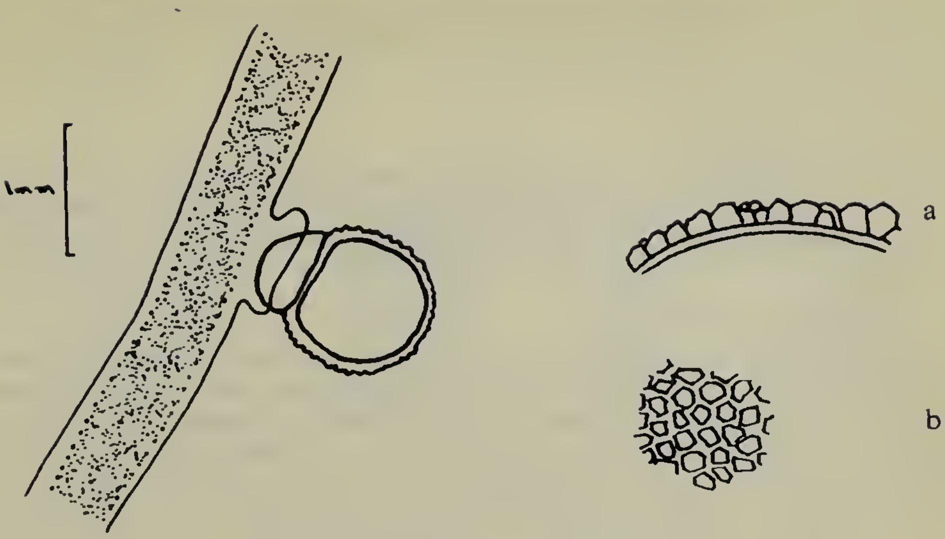


Fig. 2 Nematocysts. a, Stenotele. b, holotrichous isorhizas. c, atrichous isorhiza. d, undischarged and discharged desmoneme.



Chlorohydra viridissima (Pallas)

Fig. 3 Fertilised egg, with enlarged views of the theca in a, sectional, and b, surface aspects.

Reproduction. Only one specimen with more than one bud has been seen. In this the two buds were situated diametrically opposite each other on the column, the younger bud slightly higher than the other. The buds are borne about two thirds of the way down the column. Brien and Reniers-Decoen (1950) report that in this species only under very favourable conditions is more than one bud produced. It appears that this may be characteristic of the genus as the only other data on budding, that of Brereton (1956) and Forrest (1959) is in agreement. Neither Schulze (1927) nor Brien and Reniers-Decoen (*op. cit.*) give information on the manner of tentacle growth on the buds for this species. In the Ashwell specimens they arise almost, but not quite, simultaneously.

The species is hermaphrodite and protandrous. Commonly there are three or four testes just below the hypostome, but occasionally up to seven or eight testes can be seen in mature animals. They are always confined to the distal part of the column. The testes are mammiform and carry distinct nipples (Fig. 1).

The ovaries form one third to one half of the way up the column. The fertilized egg secretes a fairly thin-walled theca which is covered with polygonal plates (Fig. 3). In form the embryotheca thus conforms to the description of Schulze (1917). As far as I could determine each hydra produced but one egg per season and this egg definitely remained attached to the column for one to two weeks. This is not in agreement with the data provided by Brien and Reniers-Decoen (*op. cit.*). In their specimens as many as seven successive eggs were produced which detached from the parent in about two days. Further work is necessary to resolve these conflicting observations. My own data are very similar to the condition described in *Ch. hadleyi* Forrest.

In fully extended egg-carrying individuals the column is often characteristically bent at the point of attachment of the egg, so that the egg is on the convex side of the bend. When deposited, the eggs are not attached to any object.

Habitat. The species is very common at Ashwell being especially numerous in clumps of *Callitriche stagnalis* Scop. which occur in the slower flowing parts of the spring basin. Occasionally it can be found on the underside of stones lying in fairly rapidly flowing water. It can be collected all the year round but sexual specimens are found only in the summer months. This is not a direct response to temperature variation as previous work (Ball, 1964) has demonstrated the constancy of the temperature of these springs.

Additional Notes. From the above description of *Chlorohydra viridissima* it can be seen that the Ashwell specimens do not conform entirely with the available, and incomplete, descriptions of Continental specimens of this species. In some characters they are more similar to *Ch. hadleyi* Forrest, notably in the form of the holotrichous isorhizas and in the production and release of the eggs. Nonetheless, I can see no major reason for not assigning the Ashwell specimens to the species *Ch. viridissima,* and further discussion of their taxonomic status must await a critical study of variation in this species.

Genus HYDRA Linnaeus

Ewer (1948) has shown that the genus *Pelmatohydra* Schulze 1917 can no longer be considered valid. Consequently all species assigned to this genus must now revert to the genus *Hydra* L. None of the hydras found at Ashwell are referable to *Pelmatohydra* sensu Schulze and further discussion is therefore unnecessary.

HYDRA STELLATA P. Schulze 1914

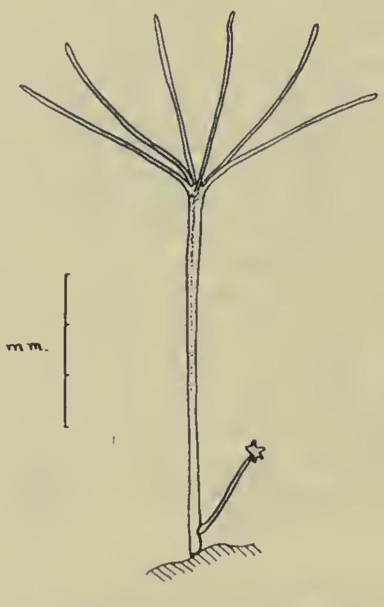
Hitherto this species has not been recorded outside Germany. Hyman believed that she had found it in America but later stated that this was a mis-identification and described her material as a new species *H. americana* (see Hyman, 1929). In my opinion the possibility that the two are synonymous remains. Hancock (1850) has described a small hydra from Northumberland lakes which could conceivably refer to this species.

Unfortunately, I have been unable to induce sexuality in the Ashwell specimens which makes their precise identification difficult. However, for several reasons they cannot be assigned to any of the species listed on p. 81. I believe them to be of a species new to Britain and in so far as a description of *H. stellata* has been published, the Ashwell specimens conform in nearly every respect. For the comparative data I have relied on the later descriptions published by Schulze (1917, 1927).

Habit. Small, column never exceeding 7 mm. in length. Tentacles usually six or seven in number, occasionally five or eight. They are much shorter than the column and are always held erect. The column is very slender and has no stalk, consequently the species is not referable to any of the species formerly assigned to the genus *Pelmatohydra.* The hypostome is shallow, flat-topped, and inconspicuous (Fig. 4).

The colour is a very pale grey or brown, the animal being almost transparent. The hypostome is usually slightly darker than the rest of the body. The ciliate which infected *Chlorohydra viridissima* was also frequently found infecting this species.

Schulze (1917) reported that in *H. stellata* a characteristic star-like posture was assumed on contraction, hence the trivial name. In the specimens described here this has not been noticed, but as Schulze (1927) later inferred that the star-like posture was not always apparent, this is not considered inconsistent with the specific identification.



Hydra stellata Schulze

Fig. 4 Extended animal with bud.

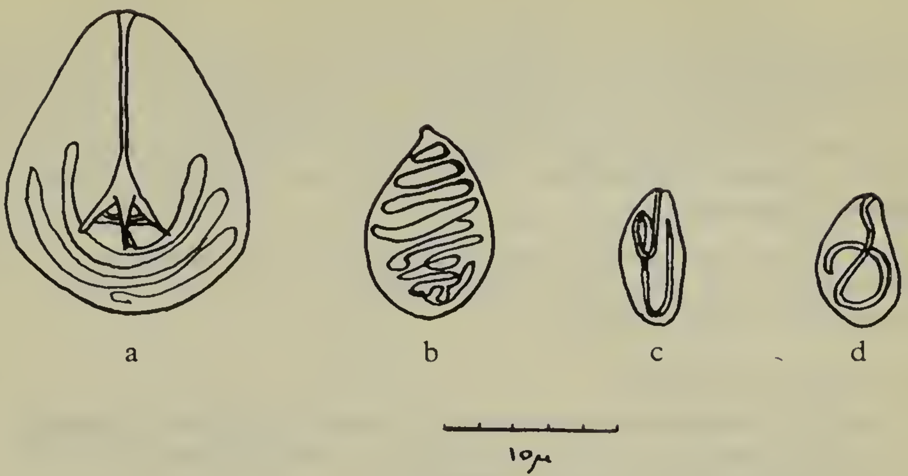


Fig. 5 Nematocysts. a, Stenotele. b, holotrichous isorhiza. c, atrichous isorhiza. d, desmoneme.

Nematocysts. These are shown in Figure 5, their size is as follows:—

Stenoteles	11.5 — 25.5μ × 10.6 — 20.8μ	mean 18.1μ × 14.9μ
Holotrichous Isorhizas	8.8 — 14.5μ × 5.3 — 10.1μ	mean 11.6μ × 7.2μ
Atrichous Isorhizas	5.3 — 10.0μ × 3.1 — 8.2μ	mean 8.0μ × 5.0μ
Desmonemes	5.3 — 9.1μ × 3.5 — 7.3μ	mean 7.7μ × 5.6μ

Measurement of Schulze's (1927) scale diagrams of the nematocysts of *H. stellata* gives:—

Stenoteles	23.0μ × 20.0μ
Holotrichous Isorhizas	11.5μ × 7.2μ
Atrichous Isorhizas	9.0μ × 4.5μ
Desmonemes	8.0μ × 5.5μ

With the possible exception of the stenoteles, which in any case show the greatest variation in size, the two sets of data are in very close agreement. The relative sizes of the nematocysts are quite different from those of other British members of the genus *Hydra* s.l. Thus in *H. vulgaris* the stenoteles and holotrichous isorhizas are about equal in size, and the desmonemes are slightly larger than the atrichous isorhizas. In *H. attenuata* the stenoteles are the largest of the nematocysts, as in *H. stellata,* but the atrichous and holotrichous isorhizas are about equal in length, while the desmonemes are much shorter.

In form the stenoteles, desmonemes, and atrichous isorhizas present no special peculiarities, but the holotrichous isorhizas are distinctive. These are plump, with a distinct point or nipple at the distal end. The first three to five coils of the thread are tight and transversely orientated (Fig. 5). The coiling then becomes loose and irregular. They fit perfectly the descriptions given by Schulze (1917, 1927) for *H. stellata* and are quite different from the holotrichous isorhizas of other hydras described from Britain.

Reproduction. No specimens with more than one bud have been seen. The single bud is borne remarkably low on the column, sometimes being less than 1 mm. from the base (Fig. 4). This unusual positioning of the bud is a further reason for identifying the specimens as *H. stellata*. The tentacles on the bud arise simultaneously.

Despite repeated efforts, involving changes in temperature and feeding regimes, I have not been able to induce sexuality in any cultures of this species. Indeed, it is very difficult to maintain cultures for any length of time and the species is decidedly less hardy than *Ch. viridissima* or *H. attenuata*. This is especially disappointing as no information on sexual reproduction in *H. stellata* has ever been published and its embryotheca is unknown.

Habitat. At Ashwell the species occurs in the same sort of places as *Ch. viridissima*, but it is more often taken from stones. It can be found all the year round but is considerably less numerous than *Chlorohydra*.

HYDRA ATTENUATA Pallas 1766

This species is mentioned here mainly to make the account complete. It is the third of the three species which I have found at Ashwell, where it occurs in small numbers mainly amongst submerged vegetation.

I am deferring a full description until such time as I have found female animals. Thus far the only sexual individuals I have encountered have been males. In general habit, in the size and form of the nematocysts, and in budding and tentacle growth, the Ashwell specimens agree closely with the descriptions given in Schulze (1917) and Ewer (1948). In a healthy culture it is easily distinguished from *H. stellata* by its larger size, up to 20 mm. long, its relatively stout column, longer tentacles which commonly droop at the ends, and deeper colouration. Needless to say identification should always be confirmed by an examination of the nematocysts and, where possible, the sexual organs and embryotheca.

I agree with Ewer (*op. cit.*) that *H. vulgaris* and *H. attenuata* are best regarded as separate species. I assign my material to the latter species entirely on the basis of the relative sizes of the nematocysts and on the form of the holotrichous isorhizas.

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THE LEPIDOPTERA OF YORKSHIRE

(*continued from p.* 62)

Drepana lacertinaria Linn. (Scalloped Hook-tip).

Shortly after the revision of Porritt's list there were further records from Grassington (64) in the early 1900's. The only record since then results from the Y.N.U. survey of the Malham Tarn area (64).

64. Malham Tarn, one at cottage light, 27th July, 1958.

Cilix glaucata Scop. (Chinese Character).

Of fairly general distribution, but not as common as in the South of England.

NOLIDAE

Nola cucullatella Linn. (Short Cloaked).

Not as widely reported as might be expected, presumably it is often overlooked.

61. Spurn; Skipwith, larvae, 1965.
63. Finningley, larvae, 1965; Sprotborough, larvae, 1965; Wakefield.
64. Harrogate; Leeds.

N. strigula Schiff. (Small Black Arches).

There are old records from Raincliff Woods, Scarborough (62), the last being in 1915.

Celama confusalis H. S. (Least Black Arches).

Another small insect which is frequently overlooked. There is only one record since 1903.

62. Sinnington near Pickering, 7th June, 1946.

HYLOPHILIDAE

Earias clorana Linn. (Cream-bordered Green Pea).

First recorded in the county by A. Steel, who took it at light at Thorne (63) on 7th July, 1962. It was taken there again in 1963 and larvae were found there in 1965.

Bena prasinana Linn. (Green Silver-lines).

Reported, often commonly, from many districts from the southern boundary up to Grassington (64), which is our most northerly record.

Sarrothripus revayana Scop. (Large Marbled Tort).

There are only two records in the last thirty years.

63. Bradford, at light, 1955; Halifax, at light, 1955.

ARCTIIDAE

Spilosoma lubricipeda Linn. (White Ermine).

Generally distributed and usually not uncommon.

S. lutea Hufn. (Buff Ermine).

Generally common, particularly where M.V. traps are operating. Widely distributed and more plentiful than the previous species.

N.B. The records for these two species are rather confusing due to the name *S. lubricipeda* being used by different authors for both of them.

Cycnia mendica Clerck (Muslin Ermine).

Recorded regularly from the better worked areas; two particular reports are worth repeating.

63. Huddersfield, buff males in 1914 and 1915.
64. Horton-in-Ribblesdale, 1930.

Diacrisia sannio Linn. (Clouded Buff).

Regularly reported from Skipwith and Strensall but there are many other isolated records from moorland areas and a rather surprising one from Spurn.

61. Allerthorpe; Spurn, 1947; Skipwith Common.
62. Robin Hood's Bay; Whitby Moors; Strensall Common.
63. Thorne.

Phragmatobia fuliginosa Linn. (Ruby Tiger).

Widely reported from all the higher moorlands, more often as larvae in spring than as imago in summer. Again there is an isolated report from Spurn (61), and two from Strensall (62), but surprisingly none from Skipwith.

Parasemia plantaginis Linn. (Wood Tiger).

Widely reported from all parts of the county and from two types of habitat: high moorland areas and dry grassy slopes usually associated with railway embankments but also those in Grass Wood (64). Var. *hospita* has been reported fairly frequently from the moors in the north east, in particular Barnby Moor (62).

Arctia caja Linn. (Garden Tiger).

Generally fairly common wherever there is an active collector. Reports are not as numerous as might be expected for such a conspicuous insect but they extend from Austwick (64) to Spurn (61).

Callimorpha jacobaeae Linn. (Cinnabar).

Common and generally distributed, particularly in the east and south. In the centre of the county it appears more as small isolated colonies.

Nudaria mundana Linn. (Muslin Footman).

Probably often overlooked, but records are very widespread suggesting a general distribution.

Comacla senex Hubn. (Round-winged Muslin).

Askham Bog (64) remains the stronghold of this little moth, the only other recorded locality being Spurn (61) in the Y.N.U. survey of 1952–3.

Miltochrista miniata Forst. (Rosy Footman).

There is only one record since Porritt's list.

62. Sandal Beat, 1906.

Cybosia mesomella Linn. (Four-dotted Footman).

All recent records are from Skipwith (61) and Strensall (62) Commons where it is plentiful.

Eilema lurideola Zinck. (Common Footman).

More widely distributed than any other footman.

61. Skipwith Common; Spurn; Barlby near Selby, August, 1966.
62. Strensall Common.
63. Sheffield.
64. Grassington; Harrogate.

E. sericea Gregs. (Northern Footman).

Only reported once since Porritt's list, being included in a list for Sheffield published in 1959.

CARADRINIDAE (NOCTUIDAE)

Colocasia coryli Linn. (Nut-tree Tussock).

Always very local in the county, there are only two recorded localities this century.

62. Gundale, Pickering; first recorded there at M.V. light 17th June, 1961; and again 6th May, 1962.
64. Grass and Bastow Woods, Grassington; previously the best locality but the last record was of a single larva in September, 1947.

Episema caeruleocephala Linn. (Figure of Eight).

Generally common; has been widely recorded, both as larvae, and as moths at light in the autumn.

Apatele leporina Linn. (Miller).

Widely distributed among Birch and sometimes not uncommon but all records fall in the south-western part of the county bordered by the following four localities:

61. Skipwith Common.
62. Strensall Common.
63. Sheffield, where an almost black form occurs.
64. Grassington.

A. megacephala Fabr. (Poplar Grey).

Of similar distribution to the previous species, provided always that the food-plant occurs.

A. alni Linn. (Alder).

Quite widely recorded since the M.V. light came into use, previously it was regarded as very scarce.

62. Buttercrambe, 1941; Newton Dale, 1941.
63. Wadworth Wood, Doncaster, 1919; and subsequently in the Doncaster area; Bradford; Wakefield; Sheffield, where the black form ab. *Steinerti* occurs.

64. Brayton Barff, Selby, 16th June, 1938; Harrogate; Knaresborough; Leeds.
65. Hartforth Hall near Richmond, one larva in 1943.

A. tridens Schiff. (Dark Dagger).

Probably not uncommon but only distinguished from the next species when larvae are obtained.

61. Selby; Skipwith Common.
63. Sheffield; Wakefield.
64. Askham Bog.

A. psi Linn. (Grey Dagger).

Common and generally distributed.

A. menyanthidis View. (Light Knot-Grass).

Fairly widely distributed on both high and low moors, the dark form is not uncommon.

61. Skipwith Common.
62. Strensall Common.
63. St. Ives, Bingley; Sheffield; Skelmanthorpe; Penistone; Meltham, Huddersfield; Thornton Moors, Denholm.
64. Rombald's Moor; Threshfield Moors; Malham.
65. Moors near Richmond.

A. rumicis Linn. (Knot-Grass).

Generally distributed and often common.

Craniophora ligustri Fabr. (Coronet).

Apart from the Grassington area there have only been sporadic records in recent years.

62. Pickering, 1965.
63. Little Horton, Bradford, one, 22nd June, 1951.
64. Grassington and Arncliffe, larvae usually common on Ash; Harrogate, one, 8th July, 1959.

Cryphia perla Fabr. (Marbled Beauty).

Although it fluctuates in numbers it is often common in the West Riding from Sheffield (63) to Grassington (64). It used to occur at Selby and Skipwith (61) but has not been seen there in recent years.

Agrotis segetum Schiff. (Turnip).

Common and generally distributed.

A. vestigialis Rott. (Archer's Dart).

Although primarily a coastal species occurring on sand-hills, there are some inland records.

61. Kilnsea and Spurn, common; Skipwith, occasionally; Houghton Woods near Market Weighton, 5th July, 1930 at a Y.N.U. meeting.
62. Sandburn, occasionally.
64. Selby district, not uncommon in sandy areas.

A. clavis Hufn. (Heart and Club).

Now very local and seldom recorded.

61. Kilnsea, 1st July, 1950, but not recorded there since the 1953 floods; Thixendale, several at M.V. light 5th July, 1962.

A. puta Hubn. (Shuttle-shaped Dart).

Records are few and far between but widely scattered.

61. Kilnsea, several in 1949.
63. Doncaster; Sheffield.

A. exclamationis Linn. (Heart and Dart).

Very common and generally distributed.

A. ipsilon Rott. (Dark Sword-grass).

Of frequent occurrence and wide distribution, numbers vary considerably due to migration; most numerous near the coast.

A. ripae Hubn. (Sand Dart).

There is only one known locality, the sand-hills at Kilnsea and Spurn (61) where it is common.

Euxoa cursoria Hufn. (Coast Dart).

There is no record since Porritt's list.

E. nigricans Linn. (Garden Dart).

Not common but widely distributed and recorded from all well worked areas.

E. tritici Linn. (White-line Dart).

Although primarily coastal, it is well established in some inland districts.

61. Spurn, common; Selby district, not uncommon; Skipwith Common, well established.
62. Strensall.
64. Selby district; Burley Woodhead, 27th July, 1960.

E. obelisca Hubn. (Square-spot Dart).

There is only one recent record.

61. Spurn, August, 1949.

Lycophotia varia Vill. (True Lovers' Knot).

Generally common wherever there is a good expanse of heather, but it is frequently taken well away from such a habitat.

Actebia praecox Linn. (Portland).

Originally Spurn (61) was the recognised locality for this moth in the county but it has not been reported there for fifty years. There have however been two records from inland localities.

61. Holme on Spalding Moor, 1920; Skipwith Common, 1955.

Peridroma porphyrea Schiff. (Pearly Underwing).

A migrant of very erratic appearance. In some years it is quite plentiful, particularly near the coast, but there are many widely scattered records.

Ammogrotis lucernea Linn. (Northern Rustic).

A few scattered records, all in the West Riding.

63. Bradford district; Rusby Piece, common in 1909.
64. Gaisby near Selby; Grassington, August, 1963; Kirkstall, 1953.

Rhyacia simulans Hufn. (Dotted Rustic).

No record since Porritt's list, he regarded it as doubtful.

Spaelotis ravida Hubn. (Stout Dart).

Only recorded as single specimens apart from its one stronghold at Spurn.

61. Spurn, sometimes common; Selby, one, 2nd August, 1946.
63. Little Horton, Bradford, one, 12th September, 1958, and one 14th August, 1964.
64. Far Headingley, Leeds, one, 7th September, 1960.

Graphiphora augur Fabr. (Double Dart).

Generally common throughout the county.

Amathes agathina Dup. (Heath Rustic).

Generally well distributed among heather, both on the low lying heaths and the high moors.

61. Skipwith Common, frequent; Allerthorpe Common, 1957.
62. Strensall Common.
63. Bingley Moor; Triangle near Halifax; Penistone, 1926.
64. Burley Woodhead, 1959; Harrogate, one in 1965.

A. glareosa Esp. (Autumnal Rustic).

Widely distributed on heather but not infrequently taken some distance from its natural habitat.

A. castanea Esp. (Grey Rustic).

Much less common than the previous species and surprisingly not reported from Skipwith Common.

62. Strensall Common, plentiful, both red and grey forms.
63. Sheffield, both forms on moors; Stocksbridge, 1959.
64. Harrogate, presumably wanderers from the moors; Malham.

A. baja Fabr. (Dotted Clay).

Common and widely distributed.

A. depuncta Linn. (Plain Clay).

There are only two records since Porritt's list.

62. Middlesbrough, 1906; Pickering, 16th August, 1964.

A. c-nigrum Linn. (Setaceous Hebrew Character).

Widely distributed and often common.

A. ditrapezium Borkh. (Triple Spotted Clay).

The first and only authenticated records are of two specimens at Sheffield (63), the first was taken by W. Reid on 13th August, 1950, and he took another on 24th July, 1955.

A. triangulum Hufn. (Double Square Spot).

There are many records from widely scattered areas, mainly wooded; it is not uncommon.

A. stigmatica Hubn. (Square Spotted Clay).
There is only one record since Porritt's list: Gilstead (63), 1905. This species does not appear to occur in the county now, and as other species are frequently confused with it, it seems possible that it never did.

A. sexstrigata Haw. (Six-striped Rustic).
Not uncommon, widely distributed but mainly in the damper parts.

A. xanthographa Fabr. (Square Spot Rustic).
Generally common and widely distributed.

Diarsia brunnea Fabr. (Purple Clay).
Fairly widely distributed but not often common except perhaps in certain wooded areas.
61. Skipwith.
63. Bradford; Deffer Wood; Sheffield, common; Skelmanthorpe.
64. Harrogate; Malham.

D. festiva Schiff. (Ingrailed Clay).
Well distributed and often very common. The small moorland form var. *conflua* inhabits the mosses and moors. Both forms exhibit a wide range of variation.

D. dahlii Hubn. (Barred Chestnut).
The distribution of this species has become greatly reduced since Porritt's time; there are records from only three localities.
63. Deffer Wood, 1957 and 1959; Sheffield, still common.
64. Harrogate, up to 1959 but none since.

D. rubi View. (Small Square Spot).
Fairly common and widely distributed. Two broods occur, the first of larger specimens not very numerous in early June, and the second of the much more plentiful smaller insects in about the second half of August.

D. florida Schmidt. (Marsh Square Spot).
This species is single brooded in July and the specimens are large and much lighter in colour than *D. rubi*. It was first recognised as British when some old specimens taken in Askham Bog (64) in about 1900 were examined. Its continued existence in that locality was established in 1950 (A. L. Goodson, 1951, *Entomologists' Gaz.*, **2**: 71). It has since been taken at Skipwith Common (61) and Harrogate (64).

Ochropleura plecta Linn. (Flame Shoulder).
Well distributed and sometimes common.

Axylia putris Linn. (Flame).
Recorded from many localities, indicating a wide distribution but seldom reported to be common.

Eurois occulta Linn. (Great Brocade).
Most of the records that have occurred since the Second World War were in 1955 and 1964. It is assumed that these were all of the pale grey form (the records are not sufficiently specific on this point). This form is generally believed to be a migrant from the continent and is quite distinct from the indigenous (dark) Scottish race.
61. Skipwith Common, one, 26th August, 1955.
62. Barnaby Moor, 26th August, 1948; Pickering, one, 17th August, 1964.
63. Bradford, several, August, 1964; Halifax, 8th August, 1955; Sheffield, two, 25th August, 1955 and one in 1956; Birkenshaw near Bradford, two, 28th August, 1966.

Anaplectoides prasina Fabr. (Green Arches).
Not common but occasionally taken in fair numbers in wooded areas.
61. Buttercrambe Woods in the 1930's; Skipwith Common, one, 21st July, 1956.
62. Pickering, 1963.
63. Sheffield, one, 3rd July, 1956.
64. Grass Wood, 1954; Harrogate, 1958, 1959 and 1961; Birkham Wood, Knaresborough, 1962; Malham, 4th July, 1963.

Triphaena comes Hubn. (Lesser Yellow Underwing).
Well distributed and often common.

T. orbona Hufn. (Lunar Yellow Underwing).
Porritt gives only one record and there have been none since.

T. pronuba Linn. (Large Yellow Underwing).
Certainly one of the commonest moths throughout the county.

T. janthina Esp. (Lesser Broad Border).
Common and well distributed.

T. interjecta Hubn. (Least Yellow Underwing).
The only locality for which there are any records in the last fifty years is Kilnsea and Spurn (61) where it is often common.

Lampra fimbriata Schreber (Broad-Bordered Yellow Underwing).
Fairly widely distributed throughout the wooded parts of the county, most frequently taken as larvae although it occurs fairly regularly at light traps in suitable localities.

Polia tincta Brahm. (Silvery Arches).
Not recorded since Porritt's list.

P. nitens Haw. (Pale Shining Brown).
Not recorded since Porritt's list.

P. nebulosa Hufn. (Grey Arches).
Widely distributed and often not uncommon in wooded areas where it is taken as larvae in spring and at both light and sugar in the summer.

Mamestra brassicae Linn. (Cabbage).
Widely distributed and generally common.

Melanchra persicariae Linn. (Dot).
Widely distributed and generally common.

Ceramica pisi Linn. (Broom).
Widely distributed and generally common, particularly as larvae.

Diataraxia oleracea Linn. (Bright-line Brown-eye).
Widely distributed and generally common.

Hadena w-latinum Borkh. (Light Brocade).
Recorded only from Sheffield (63) where two specimens were taken in the 1950's.

H. suasa Schiff. (Dog's Tooth).
Almost confined to the south-east corner of the country.
61. Spurn, often common; Skipwith; Selby.

H. thalassina Rott. (Pale Shouldered Brocade).
Widespread and often common.

H. contigua Vill. (Beautiful Brocade).
There is only one record this century although it is reported as common near Ollerton, Notts.
63. Little Horton, Bradford, one, 20th June, 1963.

H. trifolii Rott. (Nutmeg).
Rather uncommon but occurring sporadically over a wide area; Spurn (61), Bradford (63) and Harrogate (64) being the most eastern, western and northern records.

H. bombycina Hufn. (Glaucous Shears).
A moorland insect, widely reported and often common in suitable areas which include both the low lying 'commons' and the high moors.

H. nana Hufn. (Shears).
Not common but recorded from many different parts of the county.

H. conspersa Esp. (Marbled Coronet).
Evidently more widely distributed than formerly, there are frequent records from most parts of V.C. 61 and V.C. 63 and from as far north as Harrogate in V.C. 64.

H. bicruris Hufn. (Lychnis).
Widely distributed and probably the commonest member of the genus.

H. cucubali Fuessl. (Campion).
Much less plentiful than *H. bicruris* and probably more local but of similar overall distribution.

H. lepida Esp. (Tawny Shears).
Another widely distributed but not common species. There are a great many widely dispersed records, many of them for larvae, it appears always to be taken in small numbers.

H. serena Fabr. (Broad-barred White).
Not generally common, except at Sheffield (63), otherwise sparingly reported.
61. Kilnsea; Selby.
63. Little Horton, near Bradford; Sheffield.
64. Harrogate, one, 26th May, 1957.

Heliophobus albicolon Hubn. (White Colon).

Only very occasionally recorded away from its stronghold on the coast.

61. Kilnsea and Spurn, common.
62. Sandburn, 1919.
63. Doncaster.
64. Selby.

H. saponariae Esp. (Bordered Gothic).

Of very irregular appearance. It seems reasonable to suppose that its true habitat is in the wolds and that it would be found there more often if worked for. From there it may be assumed to wander when conditions are favourable.

61. Selby, one in 1935; Muston near Filey, two in June, 1965; Thixendale, one, 5th July, 1962.
63. Wath-on-Dearne, 1958; Wombwell; York.
64. Knaresborough, two, 29th June, 1957; Harrogate, one, 2nd July, 1957.

Tholera popularis Fabr. (Feathered Gothic).

Not so common as it used to be but still recorded fairly regularly over a very wide area.

T. cespitis Fabr. (Hedge Rustic).

Rather local but recorded over a wide area, sometimes reported as being quite common.

Cerapteryx graminis Linn. (Antler).

Widely distributed and sometimes very common.

Eumichtis adusta Esp. (Dark Brocade).

Although often regarded as a moorland insect it is of wide distribution in the county and is regularly taken in urban districts.

E. lichenea Hubn. (Feathered Ranunculous).

We have few records for this coastal moth. In Porritt's time it occurred in the Scarborough district but the record from near Filey is the only approach to V.C. 62.

61. Kilnsea and Spurn, first recorded in 1949 and confirmed subsequently; Muston near Filey, one, 23rd September, 1966.

Dryobotodes protea Schiff. (Brindled Green).

Reports of this moth, which used to be not uncommon, are now infrequent and scattered; it seems to have disappeared from the Selby area.

62. Strensall, three, 1st September, 1961.
63. Deffer Wood, 1922; Doncaster; Rossington Bridge, 1962.
64. Templenewsam, 1944; Harrogate, 1966.

Bombycia viminalis Fabr. (Minor Shoulder-Knot).

Recently it has only been reported as at all plentiful in districts where there is an abundant growth of Sallow on low ground. It is more often taken as a larva than as an imago. In some areas the dark form is prevalent.

61. Skipwith; Kilnsea, one in 1949.
62. Sandburn and Strensall.
63. Little Horton; Bradford; Sheffield.
64. Askham Bog.

Eremobia ochroleuca Esp. (Dusky Sallow).

No record since Porritt's List.

Hyppa rectilinea Esp. (Saxon).

No record since Porritt's List.

Luperina testacea Schiff. (Flounced Rustic).

Common and widely distributed.

Thalpophila matura Hufn. (Straw Underwing).

Apparently confined to the lower ground from which all records come.

61. Kilnsea and Spurn, common; Selby, fairly common.
62. Buttercrambe, 3rd August, 1957; Strensall Common.
64. Askham Bog; Selby area; Wetherby, 1919; Knaresborough, not uncommon, but not recorded on the other side of Harrogate where a M.V. trap has been operated regularly.

Procus strigilis Clerck. (Marbled Minor).

The black form is generally common and widespread, while the typical form is only found in any quantity near the coast.

P. latruncula Schiff. (Tawny Minor).

This species has only been reported from Little Horton (63) and Sheffield (63), but as both it and *P. versicolor* can only be distinguished from *P. strigilis* by examination of the genitalia our records for these three species are inconclusive.

P. fasciuncula Haw. (Middle-Barred Minor).
Common and widely distributed.

P. literosa Haw. (Rosy Minor).
Although most plentiful near the coast it occurs well into the industrial West Riding.
61. Kilnsea; Selby.
63. Little Horton; Sheffield.
64. Far Headingley; Harrogate.

P. furuncula Schiff. (Cloaked Minor).
Also primarily a coastal species but it too is taken sporadically in various inland localities.
61. Spurn, common; Selby, not uncommon.
63. Sheffield.
64. Far Headingley; Grassington, August, 1950.

Phothedes captiuncula Treits. (Least Minor).
There is only one locality known in the county, Grassington (64), where it is frequently taken flying in the afternoon sunshine in Upper Grass Wood.

Apamea oblonga Haw. (Crescent Striped).
Of very infrequent occurrence, only three specimens have been recorded in the last sixty years.
61. Selby, one, 1930; Kilnsea, one, 1st July, 1950 and one, 23rd July, 1966 at the Y.N.U. field meeting.

A. anceps Hubn. (Large Nutmeg).
Not uncommon near the coast but scarce and sporadic inland.
61. Kilnsea, 1947, 1954 and 1956; Selby, 9th June, 1959; Morton's Bog near Selby, 15th June, 1956.
63. Little Horton, one, 2nd July, 1953; Sheffield, one, 1950.
64. Askham Bog, about 1930; Bishop Wood, one, 14th July, 1955.

A. furva Hubn. (Confused).
This moth is certainly often confused with the next species, particularly when worn. This may account for the fact that, apart from one locality, we have only had one specimen reported in the last fifty years, though there were two other reports early in the century.
63. Huddersfield, common, 1908; near Sheffield, one, 1st September, 1956; Skelmanthorpe, two, August, 1910.
64. Dib Scar, Grassington, nine, 1st August, 1963, four more, 10th August, 1963 and one in 1964.

A. obscura Haw. (Dusky Brocade).
Widely distributed and common; very variable in form.

A. sordens Hufn. (Rustic Shoulder-Knot).
Common and of general distribution.

A. unanimis Hubn. (Small Clouded Brindle).
Although not really common, it is taken regularly over a wide area.

A. pabulatricula Brahm. (Union Rustic).
This species formerly occurred in the south of the county (63) and in Nottinghamshire, but there are no recent records for any part of Britain. The last available records are of two specimens from 'South Yorkshire' in 1915 and 1919. It is now generally believed to be extinct although it may well still survive in some unworked woodlands.

A. secalis Linn. (Common Rustic).
This very variable insect is common and generally distributed.

A. ophiogramma Esp. (Double Lobed).
A recent addition to the county list but there have been several records since it was first recorded by Dr. A. M. R. Heron at Wakefield (63) on 23rd July, 1956.
61. Barlby, 28th July, 1965 and 20th August, 1965.
63. Sheffield; Wakefield.
64. Kirkstall; Leeds, four in 1962; Harrogate, one each in 1958, 1959, 1960 and 1963.

(*to be continued*)

NOTES ON SOME SPIDERS FROM NAIRNSHIRE

M. B. USHER

The spider fauna of Nairnshire has been poorly recorded. Bristowe (1939) records only ten species for the county, and Merrett (1964–5) adds only one more species to this list. This is in contrast to the two neighbouring counties of Moray and Inverness which each have in excess of a hundred recorded species. A discussion of the habitats of the spiders in these two counties is given by Locket and Millidge (1961).

A certain amount of general collecting has been undertaken in Nairnshire, particularly in May and June, 1963. Sixty species of spiders are recorded in this paper for the first time from Nairnshire, as well as one further record for Moray. Collecting has been concentrated into four areas, each of which is described together with a list of the species found. The nomenclature is that of Locket and Millidge (1951, 1953). An asterisk (*) before a species name implies that it has been previously recorded from Nairnshire.

(A) — Cawdor Old Wood, south of Cawdor Village (National grid reference NH 843495). This is an area of old mixed deciduous and coniferous woodland, in which many young trees have recently been planted in gaps caused by felling. There is a very dense ground flora of grasses (*Holcus lanatus* — Yorkshire fog) and herbs (*Endymion nonscriptus* — Bluebell).

(i) Spiders occurring on or under the bark of old trees: *Ciniflo similis* Blackwall, *Harpactea hombergi* (Scopoli), **Segestria senoculata* (L.), *Salticus cingulatus* (Panzer), *Araneus umbraticus* Clerck.

(ii) Spiders found on the young trees, 1–5 ft. above ground: *Anyphaena accentuata* (Walckenaer), *Textrix denticulata* (Olivier), *Cryphoeca sylvicola* (C. L. Koch), *Pachygnatha degeeri* Sundevall, *Araneus cucurbitinus* Clerck, *Walckenaera acuminata* (Blackwall), *Monocephalus fuscipes* (Blackwall), *Diplocephalus latifrons* (O. P.-Cambridge), *Scotargus inerrans* (O. P.-Cambridge), *Erigone dentipalpis* (Wider), *Labulla thoracica* (Wider), **Lepthyphantes zimmermanni* Bertkau, *Linyphia peltata* Wider.

(iii) Spiders found amongst the ground vegetation: *Clubiona terrestris* Westring, *C. compta* C. L. Koch, *Zora spinimana* (Sundevall), *Xysticus cristatus* (Clerck), *X. audax* (Schrank), *Philodromus aureolus* (Clerck), *Tibellus maritimus* (Menge), *Heliophanus flavipes* C. L. Koch, *Evarcha falcata* (Clerck), *Lycosa agricola* Thorell, *L. amentata* (Clerck), *L. lugubris* (Walckenaer), *Tarentula pulverulenta* (Clerck), *Pisaura mirabilis* (Clerck), *Gonatium rubellum* (Blackwall), *Lepthyphantes alacris* (Blackwall), *L. cristatus* (Menge), *Linyphia clathrata* Sundevall.

(iv) Spiders collected in birds' nests: *Dismodicus bifrons* (Sundevall), *Linyphia clathrata* Sundevall.

(B) — A boggy area on the edge of the Ord Wood, two miles east of Cawdor Village (National grid reference NH 884494). The vegetation is predominantly the soft rush, *Juncus effusus*.

Lycosa nigriceps Thorell, *Pirata piraticus* (Clerck), *Theridion pictum* (Walckenaer), *Gonatium rubellum* (Blackwall), *Agyneta conigera* (O. P.-Cambridge), *Lepthyphantes obscurus* (Blackwall), *Linyphia peltata* Wider, *L. pusilla* Sundevall.

(C) — A sandy area on the east bank of the river Nairn, just north of the confluence of this river with the Cawdor Burn (National grid reference NH 844513).

Drassodes signifer (C. L. Koch), Micaria pulicaria (Sundevall), *Lycosa agricola* Thorell, *L. pullata* (Clerck), *L. amentata* (Clerck), *L. nigriceps* Thorell, *L. lugubris* (Walckenaer), *Tarentula pulverulenta* (Clerck), *T. barbipes* (Sundevall), *Trochosa terricola* Thorell, *Arctosa cinerea* (Fabricius), **Theridion sisyphium* (Clerck), **Robertus lividus* (Blackwall), *Hahnia nava* (Blackwall), *Meta segmentata mengi* (Blackwall), *Lepthyphantes alacris* (Blackwall).

(D) — A sand-spit running out into the Moray Forth, about three miles west of Nairn (National grid reference NH 822576).

(i) Spiders running amongst stones: *Lycosa agricola* Thorell, *L. purbeckensis* (F. O. P.-Cambridge).

(ii) Spiders beaten from low gorse (*Ulex europaeus*) bushes: *Xysticus audax* (Schrank), *Philodromus aureolus* var. *caespiticolis* Walckenaer, *Lycosa nigriceps* Thorell, *Ceratinella brevipes* (Westring), *Hypomma cornutum* (Blackwall), *Peponocranium ludicrum* (O. P.-Cambridge), *Poeciloneta globosa* (Wider).

Other new county records are:

Euophrys erratica (Walckenaer) and *Steatoda bipunctata* (L.) — on the walls of the Cawdor Village Hall (NH 847502).

Lycosa tarsalis Thorell — amongst ground vegetation on the margin of Delnies Wood (NH 843546).

Arctosa perita (Latreille) — on sandy forest rides in the Carse of Ardersier (NH 816561).

Dicymbium nigrum (Blackwall) — on the trunks of Scots pine trees, Delnies Wood (NH 848552).

Lophocarenum nemorale (Blackwall) — amongst the litter of Scots pine trees, Culbin Forest, Morayshire.

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S.O.S. Rhino by **C. A. W. Guggisberg.** Pp. 174 with coloured frontispiece, 16 black and white photographs and five distribution maps. Andre Deutsch, 1966. 27/6.

This is another work in the Survival series and in my opinion it is the best account of a single group of animals to be published in this series to date. Observations on the five species of Rhinos are summarised in terms of their natural history, conservation and probable futures. Each chapter inspires great respect for the animals and for the author who puts the case for their continued existence so well.

Mr. Guggisberg's own observations on behaviour make the idea of a Rhinoceros as a mammal to be studied and if possible conserved, acceptable and take one away from the truck-charging hooligan image of the cinema screen.

The Asian species, Indian, Javan and Sumatran, are perhaps of the greatest interest from the point of view that they are the least studied and this book gives the best account yet of their lives. They are in the greatest danger of extinction and in his final paragraphs the author stresses the need for immediate action. The African Rhinos, Black and White, are in a happier state all round but again there is no room for complacency.

This is a book which can be recommended to the widest possible readership; no matter whether the reader's interest is biased towards the systematics, ecology or ethology of Rhinos, or whether he is just sympathetic towards animals, this is a book to read. T.M.C.

Animal Twilight by **J. L. Cloudsley-Thompson.** Pp. 204 with 16 photographs and 15 drawings. G. T. Foulis & Co., 1967. 36/-.

Another African animal book — but with a difference. This book fills a real gap in the literature on African animals and their current plight. It is a comprehensive review of the impact of Man on the African faunal scene from the days of Ancient Egypt and Rome to the present. Traditional hunting methods, the coming of Europeans and the effect of firearms, the heyday of the hunter, animal reactions and game conservation are all covered in a clear and scholarly manner. There are lengthy quotations from the great explorers and those hunters who lived only for the present, which when placed against their proper background by the author assume their proper proportions. This is a book which everyone with an interest in conservation on a continental scale should read, and if you just like animals, read it anyway. The bibliography condensed from over 2,000 references is a good feature. The photographs by Dr. Hugh B. Cott and the drawings from historical sources illustrate the theme excellently. T.M.C.

SPIDERS AND HARVESTMEN OF THE SOUTH LANCASHIRE DUNE AREA

D. W. MACKIE

The following account of the spiders and harvestmen of the South Lancashire dune area covers that piece of the coastline from Southport in the north to Hightown in the south and includes the dune area which forms the Ainsdale Freshfield National Nature Reserve owned and managed by the Nature Conservancy. It was the original intention to cover this Ainsdale Freshfield Reserve area only, but as it is difficult to pinpoint many of my own earlier records and those of other workers, in addition to the fact that there are a number of interesting records from adjoining dune areas, it was thought best to embrace the area as a whole and include all available records to date. Some of the older records for this area are from the Check List by W. Falconer (1930), published by the Lancashire and Cheshire Fauna Committee and from subsequent reports published from time to time since then by the same Committee. To these have been added the records of my own collecting over a number of years and those of Dr. J. N. Yates, with a few from other sources. Some of the very old records in Falconer's 1930 list have been omitted, such as that of *Marpissa muscosa* (taken once in 1855) and other species that have not been seen since.

This dune area is rich in a variety of habitats which favour colonisation by spiders and harvestmen and whilst it does not have the same variety of species to be found in other dune systems lying farther south, there is no doubt that many of our less common species, especially of Linyphiids, will eventually be found to be present here by concentrated searching.

As one travels from north to south there are some differences in the structure of the component parts of this dune system. Birkdale is essentially a dune meadow area behind the yellow dunes near the sea, whilst Ainsdale is a more typical dune area with yellow dunes, dune slacks, dune meadow and heath and a fringing belt of pine woods on the landward side. Moving south, Freshfield is very similar except that the pine woods are more extensive and encroach on the dune meadow to a point much nearer the sea, although there are smaller dune slacks enclosed by parts of the pine woods. Formby dune area is somewhat similar but much narrower as the built-up parts of Freshfield and Formby towns encroach to a point nearer the sea. At the extreme south, the Hightown dunes differ somewhat, with an area of yellow dunes, dune slacks and dune meadow but there is in addition a salt marsh at the mouth of the river Alt which provides a completely different habitat not present elsewhere in this dune system.

In working this dune system, collecting was carried out so that the species occupying the various habitats could be differentiated. Habitats from the shore line moving inland are: (1) *Agropyron* dunes; (2) Yellow or mobile dunes; (3) Dune slacks; (4) Fixed dunes (dune meadow and heath); (5) Field layer shrubs, and plants; (6) Pine woods. The salt marsh habitat at Hightown is also added.

(1) AGROPYRON DUNES. The *Agropyron* dunes are poorly formed at most parts of this dune system and not much time was spent working on them. Only two species were noted: *Lepthyphantes tenuis* and *Oedothorax retusus*.

(2) YELLOW OR MOBILE MARRAM DUNES. These mobile dunes carry a large population of spiders and the following species were noted:

Attulus saltator
Agelena labyrinthica
Agroeca proxima
Bathyphantes gracilis
Bolyphantes luteolus
Centromerita concinna
Clubiona neglecta
C. stagnatilis
Erigone atra
E. dentipalpis
E. longipalpis
Lepthyphantes ericaeus
Lepthyphantes mengei
L. tenuis
L. zimmermanni
Lophocarenum nemorale
Phaulothrix hardyi
Savignia frontata
Stemonyphantes lineatus
Theridion bimaculatum
Tibellus maritimus
Typhocrestus digitatus
Troxochrus scabriculus
Wideria antica

It would appear that, at certain times of the year, these mobile dunes carry a greater spider population than at others and from note of collecting during different months, it is apparent that the larger non-Linyphiid species are to be found here in the summer months but are largely absent from October to March. From October to March the Linyphiid spider population seems to be much greater, the dominant species being *Centromerita concinna, Lepthyphantes tenuis* and *Erigone* species. Most of these Linyphiid spiders are to be found on the landward side of the yellow dunes and it is possible that they occupy the nearby dune slack habitat farther inland during the summer months, as the hot arid conditions then prevailing in the yellow dune habitat might prevent them from occupying it at that period.

The wind may have a definite influence here in building up concentrations of small spiders in the yellow dunes in the late autumn and winter. In Travis's *Flora of South Lancashire* (1963) it is stated that south-east winds (off-shore) are more frequent from September to March than north-west and west winds (on-shore), whilst the reverse holds good from April to August. This could mean that during the months when most Linyphiid spiders, both adult and young, are at the peak of their aerial dispersal flights (Oct.–Nov.) the winds then prevailing would tend to carry them from the dune slacks to the landward side of the mobile dunes and concentrations would build up there. Duffey (1956) notes that: '(Aerial) dispersal may occur at any time of the year either by immature or adult spiders and is divisible into two categories: (*a*) The dispersal of the juveniles chiefly during the summer months, in which many families are represented. (*b*) The dispersal, mainly during autumn, winter and spring, of members of the family Linyphiidae, when the majority of the individual spiders are adult'.

At Freshfield, where there is the very long Massam slack, just inland from the mobile dunes, it is possible that during the autumn and winter months, Linyphiids dispersing from this dune slack would be carried on to the landward side of the mobile dunes by the predominantly south-east winds prevailing at this time. Much more concentrated field work would be necessary before this theory could be satisfactorily proved, but it is evident, whatever the cause, that considerable population movements take place in spiders, especially in the family Linyphiidae.

(3) DUNE SLACKS. The dune slacks, which lie mostly to the landward side of the mobile yellow dunes, carry a large population of spiders of many species. Some of these slacks are very large, like Massam's slack at Freshfield which stretches for almost two miles on a line parallel to the shore. Some slacks are quite wet during winter and spring but most of them dry out and have no standing water left by the summer. The slacks carry a large variety of plants and in many, the dominant plant is the creeping willow. The following species of spiders have been noted in the slacks:

Antistea elegans
Arctosa perita
Bathyphantes gracilis
Ceratinella brevipes
Cheiracanthium virescens
Clubiona diversa
C. reclusa
C. trivialis
Cnephalocotes obscurus
Erigone atra
Euophrys frontalis
Gonatium rubens
Gnathonarium dentatum
Lepthyphantes tenuis
L. obscurus
L. zimmermanni
Linyphia pusilla
Lycosa pullata
Oedothorax foscus
O. retusus
Pachygnatha clercki
Philodromus aureolus caespiticolis
Pirata hygrophilus
P. piraticus
Tarentula pulverulenta
Tetragnatha extensa
Theridion bimaculatum
T. sisyphium
Tibellus oblongus
Trochosa spinipalpis
Typhocrestus digitatus
Salticus scenicus
Wideria antica
Xerolycosa miniata
Xysticus cristatus

In the early summer the creeping willows carry a large population of the Thomasid spider *Philodromus aureolus caespiticolis* and here also numbers of *Salticus scenicus* were found, a spider which one normally associates with walls and buildings. Large numbers of *Theridion bimaculatum,* males and females, are to be seen in the slack vegetation in spring and early summer and in a slack at Hightown, a female of the rare Lycosid *Trochosa spinipalpis* was found (Mackie, 1963).

(4) FIXED DUNES (DUNE MEADOW AND HEATH). These older consolidated dunes, with a good covering of herbs and grasses and with some Marram, carry a considerable population of spiders and the following species have been noted:

Agelena labyrinthica
Agroeca proxima
Centromerita concinna
Clubiona neglecta
C. trivialis
Drassodes signifier
Euophrys frontalis
Erigone atra
Gonatium rubens
Lepthyphantes zimmermanni
Linyphia clathrata
Lophocarenum nemorale
Meta segmentata
Pachygnatha degeeri
Pocadicnemis pumila
Poeciloneta globosa
Theridion bimaculatum
Tibellus oblongus
Xerolycosa miniata
Xysticus cristatus
X. sabulosus
Zelotes electus
Z. latreillei

Xysticus sabulosus was collected in this habitat at Ainsdale under a stone. *Agelena labyrinthica* is frequently found with its web in long herbage at Freshfield but we have not yet found it farther north than this. It appears to be at the limit of its northern range in this dune system. *Clubiona neglecta,* a typical dune species, is frequent all over the area and in this habitat there is also a considerable population of *Theridion bimaculatum* in late spring and summer. *Tibellus oblongus* is common, especially on Marram but we have not yet found *Tibellus maritimus* in this dune system.

(5) FIELD LAYER SHRUBS AND PLANTS. The field layer shrubs in the dune system consist of Gorse, Sea Buckthorn, Birch, Bramble and a number of tall plants such as Evening Primrose, Hounds Tongue and Wild Carrot. These all provide an important habitat for certain web-spinning spiders (as well as others) which prefer tall stiff plants on which to spin their webs at a certain height above ground level. The species found in this habitat include:

Agelena labyrinthica
Araneus diadematus
A. quadratus
Linyphia triangularis
Meta segmentata
Meta segmentata mengei
Philodromus aureolus
Theridion ovatum
T. sisyphium
Zygiella atrica

In this habitat, whilst *Philodromus aureolus* is not a web-spinner, it ranges widely over the foliage of small trees and shrubs in search of prey and is common. *Agelelena labyrinthica* is frequent on gorse wherever these shrubs occur.

(6) PINE WOODS. The belts of pine trees which fringe the dune areas at Ainsdale and are more widely scattered at Freshfield carry a large population, mainly of Linyphiid spiders. This is especially so in autumn and winter in the pine needle litter under trees. The following species have been noted in this habitat:

Agyneta ramosa
Bathyphantes concolor
Bolyphantes luteolus
Centromerita concinna
Diplocephalus latifrons
Drapetisca socialis
Euophrys molesta
Harpactea hombergi
Linyphia triangularis
Lepthyphantes minutus
Lepthyphantes ericaeus
L. zimmermanni
Macrargus rufus
Monocephalus fuscipes
Oonops pulcher
Pholcomma gibbum
Tapinocyba praecox
Trochosa terricola
Wideria antica

Of these species, *Drapetisca socialis* and *Lepthyphantes minutus* are to be found on the pine trunks, but the largest concentrations of other species are in the dense needle litter beneath. Here in October the dominant species are *Wideria antica, Monocephalus fuscipes* and *Lepthyphantes zimmermanni.* Earlier in the year *Harpactea hombergi* is found in the drier heaps of litter along with *Oonops pulcher.* A notable occurrence in this habitat was the finding of a female *Euophrys molesta* by J. Huxley in 1958 at Freshfield in litter at the edge of a pine wood (Mackie, 1962).

SALT MARSH AREA AT HIGHTOWN. The small salt marsh area where the river Alt enters Liverpool Bay at Hightown provides a habitat not found elsewhere in this dune system and whilst not much collecting has been carried out here, the spider fauna found so far is interesting. The species are:

Erigone atra
E. longipalpis
Gnathonarium dentatum
Hypomma bituberculatum
Lepthyphantes tenuis
L. cristatus
Lycosa purbeckensis
Oedothorax fuscus

My thanks are due to the Nature Conservancy for permission to collect in the Ainsdale Freshfield Nature Reserve and to Dr. J. N. Yates for his many records and help. I also wish to thank Mr. G. H. Locket and Dr. P. Merrett who kindly confirmed a number of identifications of the less common species.

SPIDER SPECIES LIST. Nomenclature follows the check-list in _British Spiders_ by Locket and Millidge (1951–53). _Note:_ Those species marked with an asterisk (*) have been recorded from the area covered by the Ainsdale Freshfield Nature Reserve.

DICTYNIDAE
Ciniflo similis
Dictyna latens

OONOPIDAE
*_Oonops pulcher_

DYSDERIDAE
*_Harpactea hombergi_

GNAPHOSIDAE
Drassodes pubescens
*_D. signifer_
Micaria pulicaria
Zelotes pusillus
*_Z. electus_
Z. latreillei

CLUBIONIDAE
*_Clubiona reclusa_
*_C. stagnatilis_
*_C. phragmites_
*_C. neglecta_
*_C. trivialis_
*_C. diversa_
*_Cheiracanthium virescens_
*_Agroeca proxima_

THOMISIDAE
*_Xysticus cristatus_
X. audax
*_X. sabulosus_
*_Philodromus aureolus_
*_P. aureolus caespiticolis_
*_Tibellus oblongus_

SALTICIDAE
*_Salticus scenicus_
*_Euophrys frontalis_
*_E. molesta_
Sitticus pubescens
Attulus saltator

LYCOSIDAE
*_Lycosa purbeckensis_
L. monticola
*_L. pullata_
*_Xerolycosa miniata_
*_Tarentula pulverulenta_
*_Trochosa ruricola_
*_T. terricola_
T. spinipalpis
*_Arctosa leopardus_
*_A. perita_
*_Pirata hygrophilus_
*_P. piraticus_

AGELENIDAE
*_Agelena labyrinthica_
*_Antistea elegans_
*_Hahnia nava_

MIMETIDAE
*_Ero furcata_

THERIDIIDAE
*_Steatoda bipunctata_
*_Theridion sisyphium_
*_T. ovatum_
*_T. bimaculatum_
*_T. pallens_
Robertus lividus
*_Pholocomma gibbum_

TETRAGNATHIDAE
*_Tetragnatha extensa_
*_Pachygnatha clercki_
*_P. degeeri_

ARGIOPIDAE
*_Meta segmentata_
*_M. segmentata mengei_
*_Araneus diadematus_
A. quadratus
A. redii
*_Zygiella atrica_

LINYPHIIDAE
*_Ceratinella brevipes_
Walckenaera acuminata
*_Wideria antica_
*_Cornicularia vigilax_
*_Dicymbium nigrum_
Entelecara flavipes
*_Gnathonarium dentatum_
Dismodicus bifrons
Hypomma bituberculatum
*_Gonatium rubens_
Maso sundevalli

Pocadicnemis pumila
Oedothorax fuscus
**O. retusus*
**Lophocarenum nemorale*
Silometopus curtus
Mecopisthes pusillus
**Cnephalocotes obscurus*
Troxochrus scabriculus
**Tapinocyba praecox*
**Monocephalus fuscipes*
**Gongylidiellum vivum*
Erigonella hiemalis
Savignia frontata
**Diplocephalus latifrons*
**Typhocrestus digitatus*
**Erigone dentipalpis*
**E. atra*
E. arctica
**E. longipalpis*
**Leptorhoptrum robustum*
**Drepanotylus uncatus*
**Phaulothrix hardyi*
**Porhomma pygmaeum*
Agyneta subtilis
A. conigera
**A. ramosa*
**Meioneta rurestris*
Microneta viaria
**Centromerus sylvaticus*
**C. expertus*
C. prudens
Centromerita bicolor
**C. concinna*
**Macrargus rufus*
**Bathyphantes approximatus*
**B. concolor*
**B. pullatus*
**B. gracilis*
B. parvulus
Poeciloneta globosa
**Drapetisca socialis*
**Tapinopa longidens*
**Stemonyphantes lineatus*
**Bolyphantes luteolus*
Lepthyphantes leprosus
**L. minutus*
**L. obscurus*
**L. tenuis*
**L. zimmermanni*
L. cristatus
**L. mengei*
**L. ericaeus*
**Linyphia pusilla*
**L. triangularis*
**L. clathrata*

HARVESTMEN (*Opiliones*)

Ten species of harvestmen have been recorded in the South Lancashire dune area and a list of these species follows. As in the spider species list, those marked with an asterisk (*) have been found within the area of the Ainsdale Freshfield Reserve.

**Nemastoma lugubre* Müll. At grass roots in various habitats where the humidty is high.
**Leiobunum blackwalli* Meade. In pine litter and on pine trunks.
Mitopus morio Fabr. In long herbage.
**Oligolophus agrestis* Meade. Common at grass roots, in Marram and pine litter.
O. tridens C.L.K. Frequent in similar situations.
**Oligolophus hanseni* Kraep. Occasional in pine litter.
**O. meadei* Camb. At Marram roots.
**Lacinius ephippiatus* C.L.K. Occasional in pine litter.
**Phalangium opilio* Linn. Common on dwarf willows and in Marram.
**Platybunus triangularis* Herbst. Frequent in dwarf willows and in Marram.

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PHILIP MAULEVERER GARNETT

(1906-1967)

On 11th March, 1967 Philip Garnett sat in a chair at a youth festival and died. News of his death brought a feeling of great personal loss to very many people.

Educated at St. John's College, Cambridge, he obtained his B.A. degree in 1927 and his M.A. in 1931. After teaching in boys' preparatory schools at Winchester and Cirencester he served in the Navy both during and after the war, being awarded the DSC and MBE for distinguished war service. On leaving the Navy he began an agricultural training but soon abandoned this to enter the Church, taking his theological training at Ridley Hall, Cambridge. He was ordained in 1952, became Curate at Sholing, Hants., 1952–5; Curate at Kirkby Moorside, with Bransdale and Farndale, 1955–7; Vicar at Ledsham with Fairburn, 1957; and was appointed Rural Dean of Selby in 1964.

Mr. Garnett joined the Yorkshire Naturalists' Union in 1956. Unable to attend most Y.N.U. meetings he was, however, a regular attender at the October Botanical Section Meeting and his friendly presence will be greatly missed. Interest in natural history developed early in life. The large numbers of bird books in his library were evidence of an earlier interest in ornithology, but it was as a botanist that we knew him.

Most Mondays saw him exploring the Yorkshire countryside. He never collected specimens. He wrote: 'The great attraction is simply to know that the plants are there and to picture them in their surroundings'. The effectiveness of his botanising owed much to his discovery that it helped to have an aim and to concentrate on searching for a particular plant. While at Kirkby Moorside he became interested in *Chamaepericlymenum* (*Cornus*) *suecicum* (Dwarf Cornel), finding the species in five North Yorkshire localities, his observations being published in *The Naturalist*, 1958, 2–3. Here we see in operation the method he used to such good effect. He confirmed some old record, took careful stock of the plant's habitat requirements, developed theories as to where else a particular species might be found, then searched, often with remarkable results. When Dr. Sledge suggested that the Y.N.U. Botanical Section should concentrate on confirming old stations for *Actaea spicata*, Philip Garnett entered wholeheartedly into the search, confirming many old stations and discovering new ones. 'Pip' Garnett had visited, in the past three years, most of the Yorkshire stations for this plant and knew more about its requirements than any other botanist.

The *Atlas* gave him ideas for his investigations and he became keen to seek out additional stations for species on the northern edge of their range in Yorkshire. This led, for instance, to him confirming an old and doubted record for *Sison amomum* at Paull in 1963 and was the means of stimulating others to re-find *Petroselinum segetum* and *Bupleurum tenuissimum* in the same area.

His annual holiday was spent in Scotland and here the quest was particularly for *Cystopteris montana* and here again he must have had an outstanding, if not unique, knowledge of this species. Many other species in turn held his interest. He never lost his interest in certain species thus we find him in correspondence about Lancashire stations for the Dwarf Cornel a fortnight before his death.

But it is Garnett the man, that we shall particularly miss. Integrated in his own personality were so many of those Christ-like qualities about which he had been called to teach. Always gentle, kind, friendly and cheerful, and truly humble, he thought ill of no one and was ever ready to lend the helping hand. His motives were so simply and thoroughly good. Many well-known botanists were given a warm welcome at the vicarage at Fairburn as they travelled to and from the north.

A measure of the high regard and affection in which he was held was demonstrated at his funeral service, when the old parish church of Ledsham was crowded to over-flowing. Conducted by the Bishop of Selby and the Archdeacon of York, the service was one of praise and thanksgiving, in accordance with Philip's wishes, truly reflecting his zest for life and his joyful anticipation of the life to come.

We are privileged to have known him and the greatest tribute we can pay to his memory is to go forward in hope, faith and joy, trying to capture something of the same spirit, but above all, being ourselves; that would be his dearest wish.

To his brothers, close friends, and his parishioners, we extend our deepest sympathy.

E. CRACKLES

BOOK REVIEWS

Flora of Hertfordshire by **John G. Dony.** Pp. 176 with one coloured and 31 monochrome photographs on 17 plates. Hitchin Museum, Herts. 42/- post free.

Dr. Dony has now followed up his *Flora of Bedfordshire* with one covering the neighbouring county of Hertfordshire. It is 80 years since Pryor's Flora of the county was published and inevitably, in a county situated so close to London, the intervening years have seen accelerated changes due to development (ominous word!), land reclamation and utilisation, and population pressure which have led to contraction of wild habitats and to diminution or elimination of localities for many species. Yet the county remains one of considerable botanical interest and Dr. Dony has done full justice to his subject in this account of its flowering plants.

This Flora reflects the change in modern methods of recording initiated by the B.S.B.I. mapping scheme which culminated in the publication of the *Atlas of the British Flora.* Distributions are portrayed in 696 maps of individual species whereon presence or absence is indicated in 2 km. grid squares. The coverage and detailed field work done by the author and his helpers has been very thorough and the grid-square maps provide a far fuller and more accurate picture of distribution than is conveyed in even the best of the older Floras. The maps also obviate the necessity for citing localities save for less common species or in cases where changes in present as compared with past areas or other points of interest require comment. The systematic section is preceded by a chapter on the Natural Regions in which 109 habitat studies, covering the five principle geological formations represented in the county, give full details of the floristic composition of each site. The introduction gives an interesting account of the history of the study of the Hertfordshire flora.

This thoroughly competent work is a notable addition to our regional Floras. Whilst it will obviously be of most value and interest to botanists resident in or near the county, it should do more than it sets out to do, for it also sets a high standard in the organisation and presentation of the information it contains which others would do well to emulate. We congratulate Dr. Dony on the successful completion of his task. W.A.S.

Mountain Flowers by **Anthony Huxley,** illustrated by Daphne Barry and Mary Grierson. Pp. 428 with 148 plates, 112 in colour, and 76 figures. Blandford Press, 1967. 30/-.

The multitude of colourful alpine flowers is, whether consciously or unconsciously, one of the attractions for the ever-increasing numbers of people who go abroad for holidays in the mountains. The popularity of Hegi and other books by continental authors on alpine flowers, to be had in any village in Switzerland or the Tyrol, testifies to the interest which they arouse. It is therefore all the more surprising that not since Stuart Thompson's *Alpine Plants of Europe* appeared more than 50 years ago has any English author attempted to compile a reasonably comprehensive and compact illustrated guide to alpine plants suitable for the layman on holiday.

The present work covers the Scandinavian and European mountain floras from the Pyrenees and Appennines to the Julian Alps in N. Yugoslavia, the plants included being those found above 1500 m. The illustrations cover 1,200 plants, the descriptions about 1,640 and references cover a total of nearly 1,900. Descriptions are short and designed to complete the information necessary to confirm identifications based on the illustrations, the quality of which is very good. Except for the grasses and sedges which receive summary treatment, the selection is comprehensive enough to satisfy the needs of most users. The book has been compiled with great care, is factually and nomenclaturally accurate, and though it is intended for the layman without a background of botanical training, it should also be part of the holiday equipment of more experienced botanists. The price is modest in relation to its value. It deserves, and I have no doubt will have, the popularity which it certainly merits. W.A.S.

The Structure and Life of Bryophytes, by **E. V. Watson.** Second edition. Pp. 192 with 20 text figures. Hutchinson University Library, 1967. Paperback 10/6d., Hardback 25/–.

This is an unaltered reprint or new impression of the book published in 1964 and reviewed in *The Naturalist*, 76, 1964. One of the best works in the series; strongly recommended to all students taking a course in bryophytes at degree level.

How we got our Flowers by **A. W. Anderson.** Pp. 283 with 55 drawings by Alex Jardine and E. Sears. Dover Publications Inc., agents, Constable & Co. 14/-.

Behind the introduction from all parts of the world of the multitudes of well-known horticultural plants grown in our gardens and greenhouses, there lie many stories of adventure. The plants themselves are now far better known than the men whose names they so often immortalise. How many of us, familiar with *Forsythia*, *Tradescantia*, *Bougainvillea*, *Menziesia*, *Douglasia* or the many specific names commemorating the discoverers of now well-known plants, know much, or indeed anything, about the lives of the men whose names they bear? These men were often colourful characters who led adventurous lives; many were famous, one or two were infamous; one indeed who was no mean naturalist was also a pirate described — and not by Mr. Anderson — as 'an associate of some of the most desperate and abandoned buccaneers and rovers that infested the seas of both hemispheres'. How many would recognise this romantic character amongst the commemorative names of horticultural treasures?

Mr. Anderson's aim in this collection of more than fifty short essays is to tell us something about the men whose exploits have enriched our gardens and collections. He has succeeded in producing a very agreeably written miscellany of history, adventure and biography which can hardly fail to give a good deal of instruction as well as enjoyment to anyone interested in flowers. W.A.S.

The Peregrine by **J. A. Baker.** Pp. 191. Collins. 21/-.

No monograph this, of the customary style, but a rare, beautifully written account of a winter's observations backed by ten years of following the peregrine. The author uses diary form in which he really captures the 'feel' of the estuary and saltings in their many moods and reaches into the soul of the bird itself. We get away from the factual, statistical approach; from the informative text-book in which 'large and isolated in the gleaming whiteness of the page the hawk stares back at you, bold, statuesque, brightly-coloured. But when you shut the book you will never see that bird again'. Here we are shown the bird as we have really seen it, sometimes through undisguised drama (as the teal kill, p.77) and sometimes sheer poetry (the kestrel hovered . . . 'lowering like a threaded spider from the web his wings had spun').

A real artist has been at work here. The result is not only refreshing; it will surely be prized for its literary merit. R.F.D.

The Littoral Fauna of the British Isles by **N. B. Eales.** 4th Ed. Pp. xviii + 306 with 16 monochrome photographs on 8 plates and 111 text figures. Cambridge Univ. Press. 50/-.

This has been a standard reference book for the identification of littoral animals since it first appeared in 1939 and the publication of another edition testifies to the continued demand. It is therefore all the more regrettable that instead of adding 16 black and white photographs, good though these are, the opportunity was not taken of increasing the number of line drawings, which can convey so much more than short verbal descriptions. Inevitably comparisons must be made with Collins' Pocket Guide which is abundantly illustrated, cheaper, intended for amateurs (and includes littoral algae) while the present book is more academic and has greater depth but is sparsely illustrated. The new photographs and a slight change in the Introduction do not increase the usefulness of the book in proportion to the increase of 15/- on the price of this edition. J.R.L.

A Dictionary of Zoology by **A. W. Leftwich.** Pp. 319. Constable. 32/6.

A very useful book indeed for the University and senior Grammar School student, and well worth while for the older zoologist who has become immersed in specialist studies. A great array of technical terms is given covering the fields of anatomy, embryology and morphology, whilst the newer terms in physiology and ecology are not forgotten. The inclusion of many names from classification with appropriate, not too pithy, explanations makes it possible for students with limited experience to read many books and articles in which they would otherwise soon be lost.

This book is strongly recommended and is probably a very good buy for a University student. H.H.

A Key to the British freshwater Cladocera with notes on their ecology, by **D. J. Scourfield** and **J. P. Harding.** Pp. 55 with 111 text-figures. Third edition. Freshwater Biological Association, 1966. 5/-.

A Key to the British Species of freshwater Triclads, by **T. B. Reynoldson.** Pp. 28 with 1 coloured Plate and 7 text-figures. Freshwater Biological Association, 1967. 4/6.

The third edition of Scourfield & Harding's key to British freshwater Cladocera is substantially unchanged from the second edition, reviewed at length in *The Naturalist* 1958, p. 100. A number of corrections have been made and various new records and references added.

The triclad flatworms are amongst the most commonly encountered animals in fresh water and Dr. Reynoldson's key to their identification will be of considerable value to all concerned with the British freshwater fauna. The key is based largely on external features readily visible with the aid of a hand lens or low power microscope and is concise, well illustrated and easy to use. The colour plate is of high quality and will help beginners, especially, in confirming identifications made from the text. Notes are included on methods of collection, examination and preservation, on the identification of cocoons, and on triclad life histories. These form an interesting and instructive supplement to the key and may well encourage non-specialist users into closer studies of the free-living flatworms. This is a worthy addition to the list of keys published by the Freshwater Biological Association and, like many of its predecessors, will prove to be an indispensable aid to any outing, field course or other activity concerned with freshwater biology. J.B.J.

He and I and the Elephants by **Bernhard Grzimek.** Pp. 208 with 59 photographs and 4 maps. Andre Deutsch & Thames and Hudson, 1967. 30/-.

Dr. Grzimek and his son Michael made the trip to the Ivory Coast, which forms the subject of this book, when the latter was sixteen years old. The book now appears as a sort of memorial to Michael who was killed in the course of their later work in East Africa.

It is not an African animal book in the usual style but contains a generous helping on the people and conditions of an African state prior to political 'emergence'. The last chapter concerns a trip made by the author alone, after the country emerged from French rule: the comparisons tend to be odious. With regard to the animals, the larger species must look to tourism for their salvation, but one feels that the secretive fauna of the forests will continue to cope in spite of any changes and it was the tantalising glimpses of these animals which interested me most in this book. T.M.C.

Animal Timekeepers by **Navin Sullivan.** Pp. 64 with 30 text figures. Phoenix House, London. 1967. 12/6.

This slim volume assembles a variety of interesting facts about the experiments and discoveries connected with the ability of many living creatures to 'tell the time'. It is a brief and superficial survey and, to judge by the style at the beginning of the book, obviously directed at children of junior school age. However, the later parts would only be intelligible to older children. These may be stimulated by this book to find out more for themselves but I felt that it would have been better either to have written in a simpler style or to have expanded the book to give more details.

J.R.G.

The Vivarium by **George F. Hervey** and **Jack Hems.** Pp. 88. 4 monochrome plates and 10 figures. Faber & Faber. 1967. 16/-.

The authors state in their preface that this book is not designed as a work of reference but as a general work to be read by all who are interested in keeping amphibians and reptiles as pets. It deals systematically with a selection of amphibians and reptiles from all over the world and if this encourages more people to support the importation of these, I for one shall be sorry. I am thinking of the tortoises-in-barrels scandal. In a book of this size the treatment is of necessity somewhat sketchy and in spite of what the authors say it seems to me that its format is too much that of a reference book to be suitable for continuous reading and not sufficiently weighty for the serious vivarium keeper. J.R.G.

Mattie, The Story of a Hedgehog by **G. D. Griffiths.** Pp. 86. 15 figures. The World's Work Ltd. 1967. 16/-.

This imaginative story of a hedgehog from birth to death is beautifully written and the illustrations by Elsie Wrigley help to make this an attractive little book. It would be appreciated by country-loving children and adults alike. The author avoids sentimentality and, with a few exceptions, anthropomorphism. However there are some points where one questions the accuracy. I can find no reference in scientific literature to hedgehogs eating their own young and the old legend of hedgehogs impaling apples on their spines occurs in a modified form. Apart from this criticism this is wild life narrative at its best in the tradition of Henry Williamson and Richard Jeffreys. J.R.G.

Living with Monkeys by **Vera Ryder.** Pp. 115 with 14 black and white photographs. Dent, 1967. 25/-.

The author became a monkey owner late in life and was thus able to satisfy a long-standing ambition. This is the story of her first few monkeys and the way in which she and they reacted to each other. A large family, a more than average number of other pets, and the monkeys, provide the ingredients for a light-hearted story which, whilst it is not a guide to successful monkey keeping, has the ring of authentic experiences. T.M.C.

Enquire Within About Animals, by **Brian Vesey-Fitzgerald.** Pp. 232 with 16 black and white photographs. Pelham Books, 1967. 30/–.

In question and answer form the author deals with many aspects of the animal kingdom. Some of the questions are a little contrived but nevertheless the answers are invariably readable and instructive. A seventeen page bibliography is an admirable feature and tells the reader where next to go for further information. This is a useful compilation and can be recommended for youngsters with enquiring minds, and for many adults too. The scientific names which are used throughout show a refreshing degree of accuracy for a work of this type. T.M.C.

The Crab that Crawled out of the Past by **Lorus J. Milne** and **Margery Milne** with illustrations by Kenneth Gosner. Pp. 80. G. Bell & Sons Ltd. 1967. 13/6.

Horshoe or King Crabs have been present on earth for 500 million years and during the greater part of this vast period have undergone little apparent change. Although colloquially termed crabs they have little in common with the familiar true crabs of the seashore. Lorus and Margery Milne have written a simple non-technical account of the natural history of these grotesque and fearsome looking, but quite harmless, creatures. In addition to the King Crabs the text includes a description of the succession of animal types which arose, prospered, declined and disappeared while the King Crabs themselves pursued their timeless course. This slim volume will hardly appeal to adults, but the style of both the writing and the illustrations suggest that it might well be acceptable to the young (under 15) natural history enthusiast with thirteen-and-sixpence left over from his (or her) birthday pocket money.

R.W.O.

The Polio Story by **P. J. Fisher.** Pp. xiii + 125 with 27 photographic illustrations and 9 figures. Heinemann. 1967. 35/-.

This slim volume is a concise and well written account of the history of bacteriology, from the time of Pasteur to the development of Sabin's poliomyelitis vaccine. The story of the search for a successful vaccine against poliomyelitis and the debate between the protagonists of the 'dead' and the 'live' vaccines makes fascinating reading. In the final chapter the dramatic use of Sabin's vaccine in the 1961 Hull epidemic is described in detail. Much information is put into very small space but the relatively high cost of the volume is hardly commensurate with its size.

J.D.P.

SPURN BIRD OBSERVATORY

Report for 1966 now available, price 3/6d. post free, from The Warden, Spurn Bird Observatory, KILNSEA, via Patrington, Hull, East Yorkshire.

WANTED. Copies of *The Naturalist* for Jan. — March 1964 and April — June 1964. Will anyone who can supply please forward to The Editor of *The Naturalist*, The University, Leeds 2.

AL H

WESTERN ATLANTIC FULMARS ON THE EAST YORKSHIRE COAST

PATRICK J. BOYLAN

In February and March, 1962, after a prolonged period of storms and severe westerly gales in the North Atlantic, an unprecedented 'wreck' of Fulmars occurred in the North Sea. On the Yorkshire coast alone at least 342 dead or dying Fulmars were found during the period 18th February to 24th March, of which 287 were found on the Holderness coast (East Yorkshire, from Sewerby to Spurn) during systematic searches organised by Brian S. Pashby and John Cudworth, in which the Hull Scientific and Field Naturalists' Club and the Spurn Bird Observatory took part. Smaller numbers continued to be found until 15th April (Bunce, 1963a and b; Cudworth and Pashby, M.S.). The high proportion of darker birds seen, immediately suggested that many of the birds were not from a British population. This conclusion has now been confirmed by detailed studies of a series of six skins preserved by A. H. Rider of the Hull Scientific and Field Naturalists' Club, and subsequently presented to the Kingston upon Hull Museum. When classified according to the colour-phase scheme of Fisher (1952), 42 specimens recorded between Bridlington, E. Yorks., and Humberstone, N. Lincs. were grouped as follows:

LL.	('Double Light')	18 specimens
L.	('Light')	17 specimens
D.	('Dark') or DD. ('Double Dark')	7 specimens

The subspecies of the Northern Fulmar

For many years all of the Fulmars of the northern hemisphere were included in either the 'Atlantic' *Fulmarus glacialis glacialis* (Linnaeus) or in the 'Pacific' *Fulmarus glacialis rogersii* Cassin (e.g. Witherby, 1940). However, Salomonsen (1950) re-examined skulls and bills collected in 1924 from a very large breeding colony in Admiralty Inlet, Baffin Island (North West Territories, Canada), and demonstrated that this population belongs to a short-billed form, for which he revived (at subspecific level) the name *minor* Kjaerbølling (1852, 324). The subspecies *Fulmarus glacialis minor* (Kjaerbølling) was recognised in other parts of the Canadian Arctic and in West Greenland, and was accepted by the Check-List Committee of the American Ornithologists' Union in 1950. Further studies by Wynne-Edwards (1952) and Mathiasson (1963b) have shown that Salomonsen's conclusions were amply justified, and

Population	Sex	Bill length in mm.		
		mean length (with standard error)	'normal' range (i.e. ⅔ of population)	extreme range
(a) *Fulmarus g. minor* (Baffin Island, Ellesmere Island, Devon Island, W. Greenland.)	♂	36.5 ± 0.2	34.9 — 37.1	33.2 — 39.0
	♀	34.2 ± 0.4	32.5 — 35.9	31.0 — 38.5
(b) *Fulmarus g. glacialis* 'Spitzbergen type' (Spitzbergen, E. Greenland, Jan Mayen, Bear Island, etc.)	♂	38.6 ± 0.2	37.5 — 39.7	36.6 — 41.0
	♀	36.6 ± 0.3	35.2 — 38.0	34.5 — 39.4
(c) *Fulmarus g. glacialis* 'European type' (Faeroes, British Isles, Iceland, etc.)	♂	40.5 ± 0.3	38.9 — 42.1	35.5 — 43.6
	♀	37.5 ± 0.2	36.2 — 38.8	35.0 — 41.5

Fig. 1. Variations of bill length in North Atlantic (and adjacent) Fulmar populations. Based on Mathiasson (1963b) and Wynne-Edwards (1952).

Hull Museums Reg. No.	Date Locality Source	Age Sex	Colour (see note below)	Measurements (mm.)				Variation from mean bill-length North Atlantic populations (see Fig. 1)			subspecies
				Wing	Tail	Tarsus	Bill		*glacialis*		
								minor	'Spitzbergen type'	'European type'	
196/62/4	3.3.1962 Easington J. Cudworth (Spurn B.O.)	Ad. ♂	L.	314	132	48.5	34.8	−1.7	−3.8	−5.7	*minor*
196/62/6	3.3.1962 Easington J. Cudworth (Spurn B.O.)	Ad. ♀	D.	316	126	48.5	34.3	+0.1	−2.3	−3.2	*minor*
196/62/7	3.3.1962 Easington J. Cudworth (Spurn B.O.)	Ad. ♂	D.	329	134	48	39.0	+2.5	+0.6	−1.5	?*minor*
196/62/5	18.3.1962 Bridlington A. H. Rider	Ad. ♀	L.	298	122	51	36.9	+2.7	+0.3	−0.6	?*minor*
196/62/3	15.4.1962 Kilnsea A. H. Rider	Ad. ♂	LL.	324	135	54	40.2	+3.7	+1.6	−0.3	*glacialis*
196/62/2	2.3.1962 Hornsea A. H. Rider	Imm. ♀	LL.	300	114	48.5	37.8	+3.6	+1.2	+0.3	*glacialis*

Fig. 2. Details of the six specimens of Fulmar from the Holderness Coast, 1962, preserved in the Hull Museums. (*Note:* the classification of colour follows that of Fisher, 1952, as follows: D. = 'dark' phase; L. = 'light' phase; LL. = 'double light' phase.)

the subspecies has been accepted in definitive North American studies, such as those of Snyder (1957, 39–42), Palmer (1962, 141–52), and Godfrey (1966, 21–2). According to Godfrey, *Fulmarus g. minor* is the only subspecies of Fulmar which breeds in Canada.

Wynne-Edwards (1952) has also shown that within the type subspecies *Fulmarus g. glacialis* (excluding those populations now included in the subspecies *minor*) two groups can be distinguished on the basis of bill-length: a medium-billed 'Spitzbergen type' breeding in Spitzbergen, Bear Island, Jan Mayen and East Greenland, and a long-billed 'European type' breeding in the British Isles, Faeroes and Iceland. Mathiasson (1963b) has added further measurements to those of Wynne-Edwards and has reached the same conclusion. However, although there are clear differences between the average bill-lengths of these two groups, the extremes overlap to such an extent that they cannot be separated. The variations of bill-length in *Fulmarus g. minor* and the two forms of *Fulmarus g. glacialis* are given in Fig. 1. The 'normal range' given in the fourth column shows the limits within which 68% of the measured specimens have been found to lie. For further details see Wynne-Edwards (1952) and Mathiasson (1963b). Except for bill-length, the measurements of male *Fulmarus g. minor* are similar to those of *Fulmarus g. glacialis*, but females of *Fulmarus g. minor* are markedly smaller than those of *Fulmarus g. glacialis*. Godfrey (1966) found that the mean wing length in females of *Fulmarus g. minor* 283.6 mm., with an observed range of 258–310.5 mm., as compared with a range of 308–340 mm. in British females of *Fulmarus g. glacialis* measured by Witherby (1940). Intermediate or dark colour-phases ('L.', 'D.' or 'DD.') predominate in *Fulmarus g. minor*, whereas almost all of the birds in the populations of Britain (excluding Shetland) can be classed as 'LL.'. The other European populations and the 'Spitzbergen type' fall between these two extremes.

According to Mathiasson (1963b) nine birds which can certainly, or almost certainly, be attributed to *Fulmarus g. minor* have been recorded from Europe prior to 1962, including one female from Blakeney, Norfolk, on 29th September, 1928. This specimen (British Museum (Natural History) No. 1951/13/206: W. A. Payn Collection) has previously been described by Wynne-Edwards (1952). In the spring of 1962 five more specimens were recorded from Sweden (Mathiasson, 1963 a and b) and one was recorded in Schleswig-Holstein, North Germany (Ruthke and Frantzen, 1963).

The Hull Museum specimens from the 1962 'wreck'

The six specimens preserved in the Hull Museum have been carefully examined and measured. In view of the special significance of bill-length measurements, it should be noted that the standard procedure in the case of Fulmars is to measure the cord-length of the culmen from the tip of the bill to the roots of the final feathers on the mid-line of the upper mandible. The measurements were taken with dividers, using a diagonal scale accurate to ± 0.1 mm. The standard measurements are recorded in Fig. 2, together with details of dates, localities, age, sex (determined by dissection), colour-phase, etc. The variation in bill-length of each specimen from the mean bill-lengths of the three known groups of North Atlantic Fulmars is also shown. The bill-lengths in Fig. 2 are those actually observed, but it is important to note that in three of the specimens, abrasion shortly before, or soon after death has removed some of the final feathers on the mandible, so that the measured lengths are somewhat greater than the true standard measurements in life, as follows:

specimen no.	measured bill-length	probable true bill-length
196/62/4	34.8 mm.	33.4 mm. — 34.5 mm.
196/62/6	34.3 mm.	32.5 mm. — 33.9 mm.
196/62/5	36.9 mm.	35.7 mm. — 36.5 mm.

At an early stage it was noted that the 'Light' adult male (196/62/4) and the 'Dark' adult female (196/62/6) both have measured bill-lengths which fall outside the known extreme limits of any *Fulmarus g. glacialis* population, and which clearly suggested the western *Fulmarus g. minor*. This view was strengthened when these were compared with undoubted *Fulmarus g. glacialis* specimens. In the case of the male 196/62/4 there can be little reasonable doubt that it is a specimen of *Fulmarus g. minor*. The males of the 'Spitzbergen type' show a standard deviation of ± 1.1 mm.

(Mathiasson, 1963b) so the measured length of this specimen is shorter by 3.4 times the standard deviation than the mean 'Spitzbergen type' male bill and disregarding the difference between the measured length and the probable true length the specimen lies more than 1.6 times the standard deviation outside the known extreme limits of this group. On the other hand it lies slightly below the 'normal' range of males of *Fulmarus g. minor.* Statistically there is always a possibility that a female *Fulmarus g. glacialis* might be found with a bill as short as that of 196/62/6, since its measured bill-length of 34.3 mm. is only just outside the extreme limit of females of the 'Spitzbergen type'. However, its observed bill-length lies close to the mean length of females of the Canadian population, and its true bill-length is almost certainly less than 34.0 mm., so *Fulmarus g. minor* is again indicated.

In the summer of 1964, the Hull Museum specimens were sent to the Naturhistoriska Museum, Goteberg, Sweden, for examination by Mr. Sven Mathiasson, and for comparison with the Swedish specimens of *Fulmarus g. minor* found at about the same time as the Yorkshire specimens. Mr. Mathiasson reported that in his opinion it seems clear that the four specimens 196/62/4–7 inclusive belong to a western population. They are of the same colours as the specimens found along the west coast of Sweden. Nos. 196/62/5 and 7 have bill-lengths which exclude a certain statement, but the male 196/62/4 shows a length of bill which indicates a true western origin and the same seems to be true for the female 196/62/6 as measurements of those birds indicate *Fulmarus g. minor*. Mr. Mathiasson also pointed out that the two larger specimens (196/62/5 and 7) were within the extreme limits of *Fulmarus g. minor* and suggested that since they occurred at the same time as the other western Atlantic birds, one might assume that their arrival in the North Sea was also connected with the severe westerly storms in the Atlantic.

Other measurements of Fulmars from the 1962 'wreck'

A 'Light' female Fulmar (bill-length 36.0 mm., wing 319 mm.) was found dead at Spurn (Spurn B.O.) on 18th February, 1962, and is preserved in the Bolton Museum.

On 3rd March, 1962, visitors to the Spurn Bird Observatory gathered together all of the dead Fulmars on the beaches between Spurn and Dimlington (30 specimens, excluding the three museum specimens), and these were measured and recorded by J. Cudworth, together with seven specimens collected shortly afterwards in North Lincolnshire between the Humber mouth and Humberstone. The bill-lengths were measured with dividers to the nearest half-millimetre, and colour-phase was determined, but the sex of the dead birds was not determined by dissection. These measurements are summarised in Fig. 3, where they are compared with the normal and extreme ranges of the 'European' and 'Spitzbergen' forms of *Fulmarus g. glacialis* and of *Fulmarus g. minor.* Unfortunately, since the sex of the specimens are not known, it is impossible to make certain attributions, except that one 'D.' (39.5 mm.) and two 'LL.' specimens (41 mm. and 41.5 mm.) are almost certainly *Fulmarus*

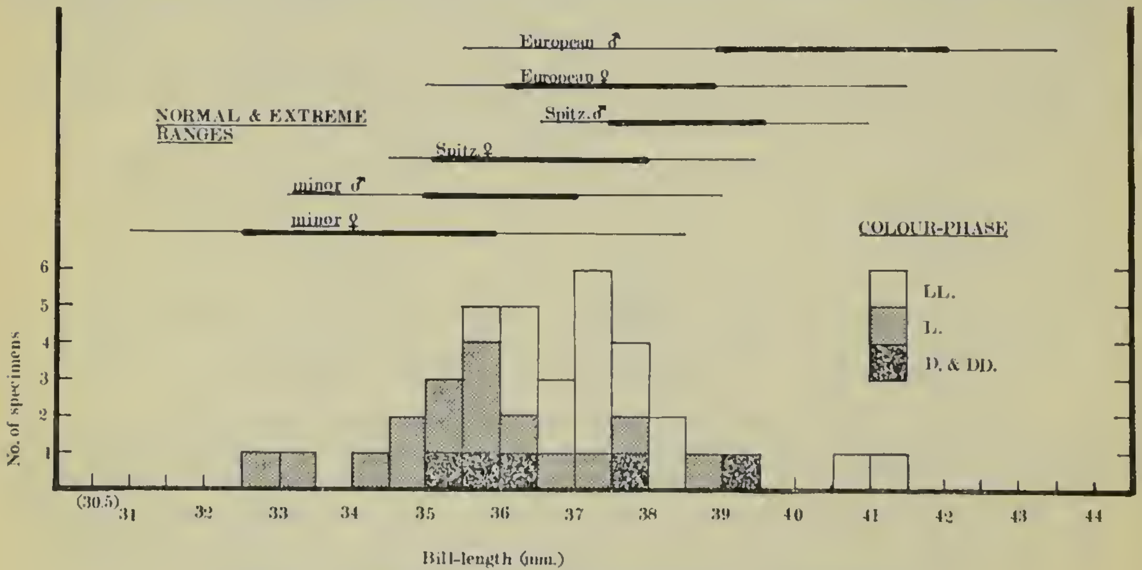

Fig. 3. Unsexed Fulmars, recorded by J. Cudworth.

g. glacialis, and the two 'L.' specimens measuring only 33 mm. and 33.5 mm. are almost certainly *Fulmarus g. minor*. However, these measurements are of some value, since they are an unselected sample of the birds involved in the 1962 'wreck'. The mean of the 37 specimens is 36.9 mm., which is considerably less than the mean of the 'Spitzbergen type' (37.6 mm.) and of the 'European type' (39.0 mm.). In fact, the mean of the 32 specimens which are indeterminate is even smaller (35.3 mm.), and it seems very likely that a substantial proportion of these birds were from a western population.

Conclusions

Of the six specimens preserved in the Hull Museum from the 1962 Fulmar 'wreck' two specimens can be certainly referred to *Fulmarus g. glacialis* (Linnaeus): the adult male 196/62/3 and the immature female 196/62/2. Two specimens can be referred, with a good degree of certainty, to the Canadian-West Greenland subspecies *Fulmarus g. minor* (Kjaerbølling): the male 196/62/4 and the female 196/62/6, both found on the foreshore at Easington, by J. Cudworth on 3rd March 1962. Two other specimens measured on that day, from the same area, but not preserved also had bill-lengths which clearly indicated *Fulmarus g. minor*. At the present moment it is not possible to make a certain determination of subspecies in North Atlantic Fulmars with males whose bills are between 35.5 mm. and 39.0 mm., or in females whose bills are between 34.5 mm. and 38.5 mm. in length. However, the two specimens 196/62/5 and 7 are similar in colour and form to the two specimens found in Yorkshire and the five specimens found in Sweden at about the same time, and it is likely that these also belong to *Fulmarus g. minor* although a certain determination is not possible.

The Blakeney, 1928, specimen is the only previous British record for *Fulmarus g. minor* and the four Holderness, 1962, specimens represent, therefore, the second British and first Yorkshire records of this subspecies. Including these four Holderness specimens, nineteen birds of this subspecies have now been recognised in Europe, of which no less than ten seem to have been brought to Europe by the exceptionally severe westerly storms of the early spring of 1962 (Mathiasson, 1963a and b; Ruthke and Frantzen, 1963, Cudworth and Pashby, M.S.).

Acknowledgements

I am very much indebted to B. S. Pashby and J. Cudworth who have allowed me to study and use their detailed manuscript report on the 1962 Fulmar 'wreck' in advance of publication, and who have critically read the draft of this paper and assisted in many other ways. I am also grateful to S. Mathiasson for his valuable report on the Hull Museum specimens and to A. H. Rider, both for preserving the specimens, and for helpful advice and discussion.

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CONSERVATION IN YORKSHIRE

CLIFFORD J. SMITH

Two new Nature Reserves have been declared in August by the Yorkshire Naturalists' Trust.

BECKHEAD WOOD: The Trust has entered into an agreement with the Earl of Halifax whereby Beckhead Wood, Great Givendale, has been created a Nature Reserve. This is a hanging Ash Wood on chalk of some nine or ten acres on the edge of the Yorkshire Wolds, and represents the first of a new type of habitat among Trust Reserves. Few such ash woods on chalk remain, and we are most grateful to the Earl of Halifax for allowing the Trust to develop it as a nature reserve at a time when it could be very profitably developed in other ways.

The wood slopes down to the valley bottom where is is bounded by an intermittent stream. Just within the western margin is a double row of old Beech trees, and the shrub layer includes Hawthorn, Alder, Mountain Ash, Elm and Fly Honeysuckle (probably an introduction). The ground flora is dominated by Dog's Mercury, Wood Sanicle, Herb-Bennet, Cowslip and Veronica spp.; there are local patches of Twayblade and Herb Christopher. The latter is almost restricted to Yorkshire and occurs in very few localities in the East Riding.

The Reserve will be controlled by a committee which has still to be formed; it will include representatives of the Trust's Council, of the Garrowby Estate and of local naturalists and will be under the chairmanship of Mr. D. H. Adams, senior biologist at St. John's College, York, who first brought the value of this area to the Trust's attention.

One of the conditions laid down by the Earl of Halifax was that the Reserve will not be open to non-members of the Trust. Any further enquiries about this new property should be addressed to the Assistant Secretary at Clifford Chambers, York.

DENABY INGS: Largely through the advice and influence of the staff of Doncaster Museum, Mr. J. B. Haigh and Mr. T. I. Bort, the Trust has recently declared Denaby Ings a Nature Reserve. It lies close to Mexborough, about eight miles south-west of Doncaster. The Reserve consists of about 35 acres of water meadow, bounded by the old bed of the River Dearne, a disused railway embankment and by the road from Mexborough to High Melton. The whole area is flooded at times, but during the summer months the drier parts are grazed by cattle. There is some permanent water and a marshy portion dominated by sedge and reed. Alders and Willows, the latter sometimes most handsome, grow on the river bank and there is some hawthorn scrub. Close by, on the other side of the railway embankment, slag heaps represent large areas which were once parts of Denaby Ings.

Many species of bird nest in the reeds and at times of migration large numbers roost in the reed beds and thickets. The usual mammals including the Fox are present and among the reptiles Grass Snakes are sometimes recorded. From the ancient Crack Willows some relict insects, now found in no other locality in the North of England, have been taken. There is, in fact, an exceptionally rich insect fauna, including a fly which parasitises one species of water snail.

A management committee is in process of formation and the Trust is most grateful to the many local naturalists who have helped establish the Reserve, and to the present owner, Mr. J. E. Soar, for his most helpful and co-operative attitude.

CHRISTMAS CARDS: The Trust has been grateful in the past for the considerable support it has received from Union members who have ordered some of their Christmas Cards from us. This year's selection is as attractive as ever, and includes the first supplies of Trust notelets.

Programmed Physiology by **I. A. Dodd.** Pp. 224. Methuen. 17/6.

One of the difficulties of teaching physiology is to ensure that the student has a thorough grasp of the physical principles underlying the subject. Any means by which these difficulties are reduced is therefore to be welcomed. Programmed teaching might make this reduction since mathematics and the physical sciences are susceptible to this form of teaching. However, this book, which has been designed as a programme for 'A' level students of biology, cannot be recommended. The programme contains a number of logical inconsistencies and ambiguities, there are numerous factual errors and the layout is unsatisfactory. D.H.J.

EVIDENCE OF PREDATION BY GREAT SPOTTED WOODPECKERS ON THE OCCUPANTS OF NEST BOXES IN A SOUTH YORKSHIRE WOOD

J. B. HAGUE

During three successive years 1958, 1959, 1960, nest boxes were erected and observed in a small private wood at Sprotborough near Doncaster in South Yorkshire. During these years the nest boxes were occupied by Great Tits (*Parus major*), Blue Tits (*Parus caeruleus*) and Tree Sparrows (*Passer montanus*). Several of the nest boxes and their contents suffered because of the activities of Great Spotted Woodpeckers (*Dendrocopos major*). Great Spotted Woodpeckers were observed in the wood during each of the three years, but were only known to breed there in 1958. Green Woodpeckers (*Picus viridis*) and Lesser Spotted Woodpeckers (*Dendrocopos minor*), were never recorded in the wood during the period of the study.

The nest boxes were constructed from half inch thick wooden board, the design incorporating a removable lid for observation purposes. Access for the birds was in most cases through a one inch diameter hole, the centre of which was positioned in the front of the nest box, two inches below the roof. In two instances the wood above the entrance hole had split away during the construction, and in consequence the hole was U-shaped. The nest boxes were tied to the trunks of trees at heights varying from four feet to five feet six inches. They were situated in both coniferous and deciduous plantations, and were visited regularly during the months of April, May and June, by myself and others.

There were four instances of predation during the breeding season of 1958. The circumstances of which were as follows.

BOX No. 8 This contained a nest and seven eggs of a Great Tit. On 26th May, it was found that a hole of approximately three quarters of an inch in diameter had been bored at nest level towards the back of the box. The hole was stained by egg yoke and the nest had been severely disturbed and part of it had been dragged towards the hole. The seven eggs were missing and some nest material was found on the ground below the nest box.

BOX No. 5 When previously visited contained an adult female Blue Tit sitting on eleven eggs. On 18th May it was found that a hole of approximately a half inch in diameter had been bored in the back of the nest box at nest level in one corner, where it was not protected by the trunk of the tree. The majority of the nest material was found on the ground below the nest box. Ten of the eggs were missing, one egg being left on the remains of the nest inside the nest box.

BOX No. 16 On 26th May the nest box contained an adult female Blue Tit sitting on seven eggs. When visited on 1st June, the nest box contained an adult female Blue Tit brooding four newly hatched young. There was a boring through the side of the nest box of approximately a half inch diameter at nest level. When visited on 8th June the boring had been increased in size, the nestlings were missing and the nest was seriously disturbed.

BOX No. 3 When visited on 1st June the nest box contained an adult female Blue Tit sitting on four eggs. On 8th June the entrance hole had been increased by chipping, to an elliptical shape of about one and a half inches vertical axis and one and a quarter inches transverse axis. The four eggs were missing.

There were four instances of interference by woodpeckers during the breeding season of 1959. The circumstances of which were as follows.

BOX No. 14 On 30th April the nest box contained a little nest material. On 5th May the entrance hole had been extensively elongated downwards into the shape of an elipse of major axis approximately one and a half inches, by chipping. The back of the box was damaged in several places, where it was not protected by the trunk of the tree, by incomplete borings. The nest material had increased in quantity but did not constitute a complete nest. This nest box did not contain a complete nest during the season.

BOX No. 6 Eight nestling Blue Tits in the nest box were ringed with British Museum Rings on 28th May. On 7th June the nest box was found to be empty, there being indications that the nestlings had fledged safely. When visited on 21st June, the entrance hole to the nest box was found to have been extensively elongated downwards by chipping, making in one direction a maximum aperture of almost two inches.

BOX No. 15 This nest box had a U-shaped entrance hole. When visited on 5th May, it was found that the entrance hole had been chipped away down the left hand side, enlarging it considerably. The nest box contained an adult female Blue Tit sitting on a partly completed nest. The bird was at least three years old as it had been ringed as an adult in the wood on 17th May, 1957. On 20th May the Blue Tit was sitting on one egg which was lying in the still incompleted nest. The same situation existed on 27th May, but on 28th May the nest box was unoccupied and the egg, which was broken, was buried beneath some nest material. The reason for the incomplete nest and clutch, and eventual damage to the single egg, cannot be ascertained. But the possible activities of Woodpeckers cannot be ignored.

BOX No. 7 This nest box had a U-shaped entrance hole. When visited it was found to contain three eggs of Tree Sparrows, and one Blue Tit's egg. (See *Naturalist*, 1960: 107–8). Two nestling Tree Sparrows fledged on 28th May. On 31st May a Great Spotted Woodpecker was observed clinging to the front of the nest box with its head through the entrance hole. Upon examination of the interior the old nest did not appear to have been disturbed. After this event a second clutch of six Tree Sparrow's eggs was laid in the nest box and eventually five nestlings fledged. When the breeding season was over the nest was carefully taken apart and the unhatched eggs of the first and second clutch were found buried, but intact, in the nest material. There was no evidence that the Great Spotted Woodpecker had ever again visited this box, the unhatched eggs of the first brood surviving the observed visit.

There were two instances of predation during the breeding season of 1960. The circumstances of which were as follows.

BOX No. 7 This nest box was the box No. 7 of 1959, which had been resited, but still had a U-shaped entrance hole. When visited on 1st May at dusk, this nest box was found to contain a male Great Spotted Woodpecker, roosting on a rough collection of nest material. The entrance hole had been chipped away down one side and had been increased in width by almost three quarters of an inch. The hole was heavily chipped about the lower half of its circumference, but penetration was not complete in this region. On 8th May the nest box was found to contain an adult female Great Tit incubating eight eggs on an untidy nest. On 26th May the eggs were found to be missing and the nest material was flattened down and covered in 'heavy' droppings. This could have been due to further roosting by the Woodpecker, but was not proved.

BOX No. 42 When last visited this nest box contained the nest and three eggs of a Blue Tit. On 8th May, the entrance hole to the nest box was found to have been enlarged by heavy chipping down one half of the circumference and the nest material had been dragged towards it. At least one egg had been removed, two punctured ones being left behind on the remains of the nest.

Another example of predation, which could not be attributed to Woodpeckers, but is worthy of record, took place in Box No. 9 during the breeding season of 1958. On 1st June, a complete brood of ten nestling Blue Tits was ringed with British Museum Rings in this nest box, which had a normal one inch diameter entrance hole. On 8th June the nest box was found to contain the wings and legs of the nestlings. The heads, bodies and tails were missing, though many small feathers were left. Some of the legs still carried rings, whilst the rings from others were loose in the nest. The nest was not unduly disturbed and the lid was in position.

Although in some instances the evidence is a little inconclusive, there is little doubt that predation by Great Spotted Woodpeckers was the cause of loss to the occupants of these nest-boxes during the three consecutive years of observation in this one locality.

The Gift of the Deer by **Helen Hoover.** Pp. 228 with pen and ink drawings by Adrian Hoover. Heinemann. 25/–.

This is a vivid account of four years of close contact between the author and a number of White-tailed Deer. The scene is set in northern Minnesota where the author and her artist husband live in company with a generous cross-section of North American wildlife. The original deer, a buck, was saved from winter starvation by the Hoovers and was later joined by a doe with fawns — twins as is usual in this species. The development of a little closely-knit herd of deer, each with its individual character, is lovingly, if often dramatically, chronicled in this work. Recommended for those who enjoy sagas, human or animal. T.M.C.

THE RUFF IN LANCASHIRE

M. E. GREENHALGH

The Ruff *Philomachus pugnax* became extinct in Britain as a breeding species in the middle of the 19th century due to drainage of the fens and extensive taking for food (Parslow, 1967). Since then it has bred sporadically in Norfolk, Durham, Suffolk and Lancashire. Now it is mainly a passage migrant to Britain, though small numbers now winter and summer regularly.

In Europe the Ruff is a widespread species, breeding from W. France and Belgium, through Sweden, Finland and into Russia (Vaurie, 1965). From the breeding areas birds pass south and west into Britain for winter or on to southern Europe and North Africa. These passage birds appear to have increased in recent years if we are to judge from records, and although there is some evidence of a population increase in Britain in recent years, any such increase is exaggerated by the increase in observation and recording since the 1940's.

The Numbers of Ruff in Lancashire

Mitchell, in 1892, stated that the Ruff was mainly a spring and autumn migrant in small numbers but was 'more uncommon than some 20 or 30 years ago. It used then to be taken in large quantities on the Ribble.' He cited an example from 1851–2 when 20 or 30 had been seen in the hand at one time which had been shot on the banks of the Ribble. It would appear, therefore, that up to about the middle of the 19th century Ruffs were abundant, especially around the Ribble estuary and in west Lancashire. A decrease then occurred together with the end of regular breeding at Martin Mere, the main breeding site in Lancashire located to the south of the Ribble estuary. This decrease was undoubtedly due to the increasing drainage and development of the Lancashire breeding haunts together with heavy losses by shooting. It is not known how many were shot in this period up to the end of the century; many hundreds must have been killed.

It is not clear whether this decrease extended into the present century. Oakes (1952) stated that the Ruff up to 1950 was still a regular passage migrant in autumn, but scarcer in spring. The last breeding record was in 1910 when a clutch of eggs was taken at Martin Mere; in the early part of the present century oology was threatening the breeding attempts as was the increasing agricultural development of the breeding haunts. Ruffs were still shot in very small numbers throughout the county. That the relative sparseness of records around the coasts was due to poor coverage by ornithologists is certain, but it should be noted that some areas of the Ribble estuary were well covered by collectors and later by watchers and during this period Ruffs were definitely sparse, although regular. In these areas large numbers of Ruff may occur today.

From 1950 (i.e. after the writing of Oakes' book), records of Ruff in Lancashire increased tremendously, especially from the area around the Ribble estuary. Much of the credit for the increase in observation resulting in the present definition of the Ruff's status on passage through the Ribble estuary must go to a team of ornithologists, A. Harrison, H. Shorrock, N. Harwood and later L. Eccles, M. Jones and others. They have shown (in *Lancashire Bird Reports*) that the Ruff was more numerous as a passage migrant than had previously been supposed and later it was established that the Ruff was a regular winter visitor to the Ribble estuary.

Up to the end of 1965 I attempted a weekly coverage of the inner Ribble marshes, a major Ruff haunt in Lancashire. Coverage was not complete, but the weeks lacking observation probably affected the results little; in peak periods I visited the area up to five times per week. From late 1965 to 1967 observations were limited especially during the early part of the year. I also made irregular observations at other sites.

Passage usually commences in early March although in 1964 the first migrants arrived in late February. The spring peak is usually much lower than that in autumn. This is due to the mortality of some birds in their winter quarters and also to the lack of build-up in spring, birds passing through rather than staying for long periods as they do in autumn. Up to 1965 the peak spring count on the Ribble was 63 in April, 1965 and up to this spring, peaks were smaller. In 1966 and 1967, however, the spring peaks were much higher with over 100 in 1967 (P. Carah, pers. comm.). These later counts have been complicated by the high numbers wintering on the Ribble in recent years.

Elsewhere in Lancashire, however, spring numbers are very small, flocks rarely being larger than ten. Records are widespread from March to May throughout the county. The spring numbers disperse quickly in late April leaving few in May and by June only the summering birds remain. These summering birds are usually males (I have only one record of a female) and often they may attain full breeding plumage. Most summering Ruff occur on the Ribble estuary, with only a few elsewhere. During spring passage, males outnumber females in ratios varying from 4:1 to 9:1.

The first individuals of autumn passage appear in late June or early July. On the Ribble estuary these may pass on or spread out over the estuary due to the dry conditions often prevelant in this period. Several influxes occur up to early August, most of these being adult males. These are followed by the immigration of juveniles and females throughout August and September. By late August flocks of up to 70 can be seen at the main haunts and this peak is maintained, with little fluctuation, until late September and even November if the weather remains mild.

Away from the Ribble autumn records are most numerous in August and September when the Ruff is quite common in small numbers, especially in the coastal strip.

The Ribble peaks disperse quickly with adverse weather conditions, low temperatures especially inciting the birds to leave. After mid-November only the wintering birds remain.

Oakes (1953) cites few winter records of Ruff but in recent years the species has wintered annually, especially on the Ribble estuary, except for the hard winter of 1962–3 when the last was seen in December. Numbers are usually small, up to 10 being normal, though in recent years very large numbers have wintered. In the mild 1966–7 winter for example, I counted 39 on 3rd January, 1967, with up to 70 from then to late March. During this period P. Carah recorded over a hundred. The majority of wintering Ruff are adult males.

THE DAILY CYCLE OF MIGRANTS

These notes are mainly taken from the Ribble estuary. Here the birds tend to spread out during the day-time to feed. Small parties feed on the salt-marshes whilst a large number often feed on fields behind the Ribble embankment. They seem to prefer to feed in ploughed fields and have been recorded following a plough, feeding on the organisms uncovered (Greenhalgh, 1965). They also feed on stubble, in meadows and on pasture, especially after rain when these fields are flooded. The main food on these fields is probably insect larvae and earthworms.

Numbers also feed on a sewage farm and in 1964 a large experimental pool was filled with dredgings from the Ribble estuary and used by feeding Ruff. Very few feed on the mudflats or sandy beaches in Lancashire.

At dusk the birds congregate at one or two sites on the estuary and it is at these roosts that most accurate counts can be made. I am not sure whether Ruff feed at these roosting sites. After dark birds call and can be heard moving.

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The Observer's Book of Pond Life by **John Clegg.** 2nd ed. Pp. 209 including 73 plates. Frederick Warne. 1967. 6/-.

In the new edition of this little book the opportunity has been taken to group all the plates together at the end. This has made possible the addition of a further 13 photographic illustrations and the new lay-out makes the book much easier to use. At the slightly increased, though still modest, price, *Pond Life* remains excellent value.

R.C.

A CATALOGUE OF DERBYSHIRE FUNGI — PART 2 BASIDIOMYCETES OTHER THAN AGARICS AND BOLETI

ERIC CAULTON

Department of Biological Sciences,
Napier College of Science and Technology, Edinburgh

N.B. This part is dedicated in affection and esteem to the memory of Laurie Holme, President of The Derby Natural History Society from 1959 until the time of his death in 1965.

The system of numerical references in parentheses after each record is the same as that used in Part I (Caulton, 1963). Host nomenclature follows Dandy (1958).

UREDINALES. (Nomenclature follows Wilson and Henderson, 1966.)
Coleosporium tussilaginis (Pers.) Lév. (4, 6, 9) on *Petasites hybridus, Sonchus arvensis* & *Tussilago farfara*
Hyalopsora polypodii (Diet.) Magn. (5, 16) on *Cystopteris fragilis*
Kuhneola uredinis (Link) Arth. (8)
Melampsora populnea (Pers.) Karst. (5, 7, 8, 9, 16, 28) on *Mercurialis perennis* & *Populus tremula*
Melampsorella caryophyllacearum Schroet. (8) on *Cerastium arvense*
M. symphyti Bub. (28, 30) II on *Symphytum officinale*
Melampsoridium betulinum (Fr.) Kleb. (4, 9) on *Betula pubescens*
Milesina scolopendrii (Faull) Henderson (8)
Phragmidium fragariae (DC.) Rabh. (7)
P. mucronatum (Pers.) Schl. (5, 7, 8, 28) on *Rosa* sp.
P. sanguisorbae (DC.) Schroet. (6, 7, 8)
P. violaceum (C. F. Schultz) Wint. (8)
Puccinia adoxae DC. (5, 7, 10, 30) on *Adoxa moschatellina*
P. aegopodii (Str.) Röhl. (28) III on *Aegopodium podagraria*
P. antirrhini Diet. & Holw. (8)
P. arenariae (Schum.) Wint. (4, 6, 8, 29) on *Silene dioica*
P. bistortae DC. (10, 30) on *Conopodium majus*
P. calcitrapae DC. (8) on *Carduus acanthoides*
P. caricina DC. (8, 28) I on *Urtica* sp. & *Urtica dioica*
P. chaerophylli Purt. (8, 28) on *Myrrhis odorata*
P. chrysosplenii Grev. (8) on *Chrysosplenium oppositifolium*
P. coronata Cda. (8)
P. galii-cruciatae Duby (8)
P. galii-verni Ces. (6) on *Cruciata chersonensis*
P. glechomatis DC. (28, 30) III on *Glechoma hederacea*
P. hieracii Mart. (4, 6, 8)
P. lagenophorae Cooke (27)
P. lapsanae Fuckel (6, 7, 8)
P. maculosa (Str.) Röhl. (7, 28) I on *Mycelis muralis*
P. magnusiana Körnicke (7)
P. malvacearum Mont. (6)
P. menthae Pers. (6, 7, 8, 10, 30) on *Mentha aquatica*
P. obscura Schroet. (6)
P. pimpinellae (Str.) Röhl. (8)
P. poarum Niels. (4, 6, 7, 9, 28, 29) 0 & I on *Tussilago farfara*
P. polemonii Dietel & Holw. (16, 19, 20)
P. pulverulenta Grev. (5, 6, 8) on *Epilobium hirsutum*
P. punctiformis (Str.) Röhl. (5, 6, 8, 29)
P. recondita Rob. & Desm. f.sp. *tritici* (6)
P. saniculae Grev. (8)
P. saxifragae Schlecht. (7)
P. sessilis Schroet. (5, 8, 28) on *Allium* sp., *A. ursinum, Arum maculatum* & *Phalaris* sp.
P. striiformis West. (8) on *Brachypodium* sp.
P. tumida Grev. (10, 28, 30) III on *Conopodium majus*
P. violae DC. (5, 7, 8, 28, 30) on *Viola* sp. & *V. reichenbachiana*

Pucciniastrum guttatum Schroet. (28, 30) on *Galium odoratum*
Trachyspora intrusa (Grev.) Arth. (7, 8, 28) on *Alchemilla vestita*
Tranzschelia anemones (Pers.) Nannf. (7, 8, 10, 28, 30) on *Anemone nemorosa*
Triphragmium ulmariae (DC.) Link (8, 28) on *Filipendula ulmaria*
Uromyces dactylidis Otth. (5, 7, 8, 10, 17c, 28, 30) on *Poa* sp., *Ranunculus ficaria* & I on *R. repens*
U. ficariae (Alb. & Schw.) Lév. (5, 7, 8, 10, 17c, 28, 30) III on *Ranunculus ficar*
U. muscari (Duby) Lév. (5, 8, 10, 28, 30) III on *Endymion non-scriptus*
U. valerianae (DC.) Lév. (7, 8, 28, 30) I on *Valeriana officinalis*

USTILAGINALES (Nomenclature follows Ainsworth & Samson, 1950)
Entyloma ficariae (B. & Br.) Fisch. v. Waldh. (8, 28) on *Ranunculus ficaria*
Urocystis anemones (Pers.) Wint. (7, 8, 28, 30) on *Anemone nemorosa*
U. violae (Sow.) Fisch. v. Waldh. (7)
Ustilago avenae (Pers.) Rostr. (30) on *Arrhenatherum elatior*
U. bullata Berk. (16) on *Bromus mollis*
U. hypodytes (Schlecht.) Fr. (16) on *Agropyron repens*
U. nuda (Jens.) Rostr. (30) on *Triticum* sp. cultivar
U. tragopogonis-pratensis (Pers.) Roussel (30) on *Tragopogon pratensis*
U. violacea (Pers.) Fuckel (5, 6, 7, 8, 28, 30) on *Silene dioica*

In the two following groups, Tremellales and Aphyllophorales, nomenclature and classification follow Carleton Rea (1922). One synonym is given for each record in parentheses, and follows the nomenclature in Bourdot & Galzin (1928) with species and page numbers where possible. Where the nomenclature is identical, *ibid.* is used with the B. & G. reference.

TREMELLALES
Auricularia auricula-judae (Linn.) Schroet. (*ibid.* 16, p. 15) (10, 17b, 28, 29, 31, 33) on *Sambucus*
A. mesenterica (Dicks.) Fr. (*ibid.* 15, p. 15) (4, 9, 31, 33)
Calocera cornea (Batsch) Fr. (*ibid.* 118, p. 73) (4, 6, 10, 29, 30) on *Platanus acerifolium*
C. stricta Fr. (4)
C. viscosa (Pers.) Fr. (*C. flammea* (Schaeff.) Quél. 116, p. 73) (4, 6, 9, 10, 29, 30)
Dacrymitra glossoides (Pers.) Bref. (*ibid.* 111, p. 70) (4, 6)
Dacryomyces chrysocomus (Bull.) Tul. (*ibid.* 109, p. 69) (5)
D. deliquescens (Bull.) Duby (*ibid.* 107, p. 67) (4, 5, 6, 7, 8, 9, 17, 18, 29)
D. stillatus (Nees) Fr. (*ibid.* 108, p. 68) (4, 5)
Exidia glandulosa (Bull.) Fr. (*ibid.* 43, p. 31) (7)
E. saccharina Fr. var. *foliacea* (Bref.) Bres. (*ibid.* 47, p. 32) (4)
E. thuretiana (Lév.) Fr. (*ibid.* 48, p. 32) (8)
Sebacina calcea (Pers.) Bres. (*ibid.* 67, p. 44) (30)
Tremella epigaea B. & Br. (*Sebacina laciniata* (Bull.) Bres. 54, p. 39) (4)
T. foliacea (Pers.) Fr. (*ibid.* 20, p. 20) (30, 34)
T. frondosa Fr. (*ibid.* 10, p. 19) (7)
T. lutescens Pers. (*ibid.* 22, p. 20) (4)
T. mesenterica (Retz.) Fr. (*ibid.* 23, p. 21) (4, 6, 8, 30) on *Fagus sylvatica*

APHYLLOPHORALES
Caldesiella crinalis (Fr.) Bourd. & Galz. (*C. ferruginosa* (Fr.) Sacc. 745, p. 471) (6)
Clavaria acuta (Sow.) Fr. (4, 6)
C. argillacea (Pers.) Fr. (*ibid.* 190, p. 116) (4)
C. cinerea (Bull.) Fr. (*ibid.* 166, p. 107) (4, 6, 10)
C. corniculata (Schaeff.) Fr. (*ibid.* 169, p. 108) (4, 6, 9)
C. corniculata (Schaeff.) Fr. var. *pratensis* (Fr.) Cotton & Wakef. (*ibid.* 169, p. 108) (6)
C. cristata (Holmsk.) Fr. (*ibid.* 156, p. 102) (6, 10)
C. dissipabilis Britzl. (*ibid.* 185, p. 114) (4)
C. fumosa (Pers.) Fr. (*ibid.* 199, p. 119) (4, 9)
C. fusiformis (Sow.) Fr. (*ibid.* 182, p. 113) (4, 6, 10)
C. inaequalis (Müller) Quél. (*ibid.* 183, p. 113) (6)
C. kunzei Fr. (*ibid.* 157, p. 103) (4, 9)
C. luteo-alba Rea (*ibid.* 184, p. 114) (4)

C. persimilis Cotton (*ibid.* 183, p. 114) (3, 4)
C. rugosa (Bull.) Fr. (*ibid.* 154, p. 101) (4, 6)
C. stricta (Pers.) Fr. (*ibid.* 147, p. 98) (31)
C. tenuipes B. & Br. (*ibid.* 191, p. 117) (4)
Coniophora arida Fr. (*ibid.* 581, p. 359) (6)
C. puteana (Schum.) Karst. (*C. cerebella* Pers. 579, p. 358) (4, 7)
Corticium albostramineum (Bres.) Bourd. & Galz. (6)
C. atrovirens Fr. (*ibid.* 310, p. 201) (4)
C. comedens (Nees) Fr. (*Vuilleminia comedens* (Nees) R. Maire 551, p. 338) (4)
C. confine Bourd. & Galz. (*ibid.* 371, p. 233) (6)
C. confluens Fr. (*ibid.* 334, p. 212) (6, 7, 17b)
C. croceum (Kunze) Bres. (*ibid.* 309, p. 201) (6)
C. lacteum Fr. (*ibid.* 279, p. 187) (4)
C. laeve (Pers.) Quél. (*ibid.* 269, p. 183) (7, 17b) on *Fagus sylvatica*
C. porosum Berk. & Curt. (*Gloeocystidium porosum* (Bk. & Curt.) Wakef. 408, p. 253) (5, 6, 7)
C. praetermissum (Karst.) Bres. (*Gloeocystidium praetermissum* (Karst.) Bres. 414, p. 256) (5, 6)
C. sambuci (Pers.) Fr. (*C. serum* (Pers.) Bres. 313, p. 203) (5, 6, 7, 8)
C. subcoronatum von Hoehn. & Nitsch. (*ibid.* 383, p. 238) (5, 6, 7)
C. vagum Berk. & Curt. (*ibid.* 391, p. 242) (6)
Cyphella capula (Holmsk.) Fr. (*ibid.* 242, p. 155) (4, 6, 8)
C. fulva Berk. & Rav. (4)
C. pimii Phill. (*ibid.* 244, p. 156) (4)
Daedalea quercina (Linn.) Fr. (*Lenzites quercina* (L.) Quél. 880, p. 578 (4, 5, 7, 10)
D. unicolor (Bull.) Fr. (*Coriolus unicolor* (Bull.) Pat. 864, p. 563) (4)
Exobasidium vaccinii (Fuckel) Woron. (*ibid.* 121, p. 75) (3)
Fistulina hepatica (Huds.) Fr. (*ibid.* 1006, p. 686) (4, 6, 17b)
Fomes annosus Fr. (*Ungulina annosa* (Fr.) Pat. 914, p. 604) (4, 5, 6, 7)
F. conchatus (Pers.) Fr. (*Phellinus salicinus* (Pers.) Quél. 935, p. 621) (6)
F. connatus Fr. (*Coriolus connatus* (Weinm.) Quél. 871, p. 569) (4, 6, 34)
F. ferruginosus (Schrad.) Massee (5, 6, 7, 17, 34) on *Corylus avellana* & *Fraxinus excelsior*
F. igniarius (Linn.) Fr. (*Phellinus igniarius* (L., Fr.) Pat. 931, p. 617) (4, 5)
F. pomaceus (Pers.) Big. & Guill. (*Phellinus fulvus* (Scop.) Pat. 933, p. 619) (8)
F. ulmarius (Sow.) Fr. (*Ungulina ulmaria* (Sow.) Pat. 913, p. 603) (31, 33)
Ganoderma applanatum (Pers.) Pat. (*ibid.* 925, p. 611) (4, 8, 9, 34) including *G. europaeum* Stayaert on *Fagus sylvatica*
Grandinia granulosa Fr. (*ibid.* 640, p. 408) (4, 5, 6)
Hydnum farinaceum (Pers.) Fr. (*Grandinia farinacea* (Pers.) Bourd. & Galz. 648, p. 412) (5, 8)
H. repandum (Linn.) Fr. (*ibid.* 703, p. 445) (4, 6)
H. repandum (Linn.) Fr. var. *rufescens* (Pers.) Fr. (*H. repandum* L. 703, p. 445) (4, 6)
Hymenochaete cinnamomaea (Pers.) Bres. (*ibid.* 620, p. 389) (17, 34) on Rosa sp.
H. corrugata (Fr.) Lév. (*ibid.* 624, p. 392) (5, 7)
H. rubiginosa (Dicks.) Lév. (*ibid.* 621, p. 390) (8)
H. tabacina (Sow.) Lév. (*ibid.* 618, p. 388) (7)
Hypochnus roseo-griseus Wakef. & Pears. (*Tomentella roseo-grisea* Wakef. & Pears. 762, p. 488) (6)
H. zygodesmoides (Ellis) Burt. (*Tomentella zygodesmoides* (Ell.) v. Hoehn. 755, p. 484) (6)
Irpex obliquus (Schrad.) Fr. (*Poria mucida* Pers. var. *radula* 988, p. 681) (4, 5, 6, 7, 8)
Lenzites betulina (Linn.) Fr. (*ibid.* 881, p. 579) (1, 3, 5, 6)
Merulius corium (Pers.) Fr. (*M. papyrinus* (Bull.) Quél. 560, p. 347) (4)
M. lacrymans (Wulf.) Fr. (*Gyrophana lacrymans* (Wulf.) Pat. 570, p. 352) (6)
Mycoleptodon fimbriatum (Pers.) Bourd. & Galz. (*ibid.* 696, p. 441) (6, 17b)
Odontia arguta (Fr.) Quél. var. *alutacea* (Fr.) Bourd. & Galz. (*O. arguta* (Fr.) Quél. 669, p. 427) (6)
**Oxyporus populinus* Fr. (17b) on *Acer* sp. & *Sambucus* sp. (cf. *Fomes connatus*)
Peniophora aurantiaca (Bres.) Bourd. & Galz. (*ibid.* 520, p. 320) (6)
P. cinerea (Fr.) Cke. (*ibid.* 531, p. 325) (5, 6, 7, 8, 17b)
P. cremea Bres. (*ibid.* 485, p. 303) (6, 7)
P. gigantea (Fr.) Mass. (*ibid.* 514, p. 318) (4, 6, 17, 34) on conifer

P. hydnoides Cke. & Massee (*Odontia hydnoides* (Cooke & Massee) v. Hoehn. 682, p. 434) (6, 7)
P. incarnata (Pers.) Cke. (*ibid.* 522, p. 321) (6, 7)
P. nuda (Fr.) Bres. var. *maculaeformis* (Fr.) von Hoehn. & Nitsch. (*P. nuda* (Fr.) Bres. 524, p. 322) (6)
P. pallidula Bres. ex Bourd. & Galz. (*ibid.* 472, p. 296) (6, 8)
P. quercina (Pers.) Cke. (*P. corticalis* (Bull.) Bres. 536, p. 328) (5, 6, 8)
P. sanguinea (Fr.) Bres. (*ibid.* 502, p. 312) (4)
P. setigera (Fr.) Bres. (*ibid.* 496, p. 309) (6)
P. subalutacea (Karst.) von Hoehn. & Nitsch. (*ibid.* 465, p. 292) (5)
P. velutina (DC.) Cke. (*ibid.* 493, p. 308) (6, 17b)
Phlebia merismoides Fr. (*P.* aurantiaca (Sow.) Karst. var. *merismoides* Fr. 556, p. 342) (4, 6, 31, 33)
Phylacteria terrestris (Ehrh.) Big. & Guill. (*ibid.* 744, p. 470) (4, 8, 9, 10)
Pistillaria micans (Pers.) Fr. (*ibid.* 217, p. 136) (8)
P. puberula Berk. (*ibid.* p. 135, tab.) (4)
P. quisquiliaris Fr. (*ibid.* p. 135 tab.) (4, 6)
Polyporus adiposus B. & Br. (*Poria undata* Pers. 1000, p. 682) (31, 33)
P. adustus (Willd.) Fr. (*Leptoporus adustus* (Willd.) Quél. 848, p. 551) (4, 5, 6, 7, 17b)
P. albidus Trog. (*Leptoporus albidus* 839, p. 545) (3, 4)
P. betulinus (Bull.) Fr. (*Ungulina betulina* (Bull.) Pat. 918, p. 606) (4, 5, 6, 7, 9, 10, 17, 18)
P. brumalis (Pers.) Fr. (*Leptoporus brumalis* (Pers.) Quél. 823, p. 530) (5)
P. caesius (Schrad.) Fr. (*Leptoporus caesius* (Schrad.) Quél. 833, p. 540) (4, 8)
P. chioneus Fr. (*Leptoporus chioneus* Quél. 838, p. 543) (4)
P. dryadeus (Pers.) Fr. (*ibid.* 928, p. 615) (6)
P. epileucus Fr. (4)
P. fragilis Fr. (*Leptoporus fragilis* (Fr.) Quél. 835, p. 542) (6)
P. frondosus Fr. (*ibid.* 807, p. 521) (4)
P. giganteus (Pers.) Fr. (*ibid.* 812, p. 523) (9, 10)
P. hispidus (Bull.) Fr. (*Xanthochrous hispidus* (Bull.) Pat. 960, p. 638) (4, 8)
P. lacteus Fr. (*Leptoporus lacteus* (Fr.) Quél. 832, p. 539) (6)
P. nummularius (Fr. Quél. (*Melanopus nummularius* Bull. 820, p. 528) (5, 6)
P. perennis (Linn.) Fr. (*Xanthochrous perennis* (L.) Pat. 946, p. 630 (4)
P. picipes Fr. (*Melanopus varius* Fr. 818, p. 527) (3)
P. radiatus (Sow.) Fr. (*Xanthochrous radiatus* (Sow.) Pat. 953, p. 633) (4, 8, 10)
P. schweinitzii Fr. (*Phaeolus schweinitzii* (Fr.) Pat. 852, p. 554) (4)
P. squamosus (Huds.) Fr. (*Melanopus squamosus* (Huds.) Pat. 814, p. 525) (4, 5, 6, 7, 8)
P. stipticus (Pers.) Fr. (*Trametes squalens* Karst. 898, p. 592) (17b)
P. sulphureus (Bull.) Fr. (*ibid.* 813, p. 524) (4, 6, 31, 33)
P. varius Fr. (*Melanopus varius* Fr. 818, p. 527) (8)
Polystictus abietinus (Dicks.) Fr. (*Coriolus abietinus* (Dicks.) Quél. 867, p. 567) (5)
P. stereoides Fr. (*Trametes stereoides* (Fr.) Bres. 903, p. 596) (10)
P. versicolor (Linn.) Fr. (*Coriolus versicolor* (L.) Quél. 863, p. 562) (4, 5, 6, 7, 8, 9, 10, 33)
Poria hymenocystis B. & Br. (*P. subtilis* (Schrad.) Bres. 966, p. 656) (6, 7)
P. sanguinolenta (A. & S.) Fr. (*ibid.* 1001, p. 682) (5, 6)
P. terrestris (DC.) Fr. (*ibid.* 963, p. 655) (4)
P. vaporaria (Pers.) Fr. (*ibid.* 989, p. 673) (4)
P. vulgaris Fr. (*ibid.* — *typica* 997, p. 679) (4)
Solenia anomala (Pers.) Fr. (*Cyphella anomala* (Pers.) Pat. 264, p. 164) (5, 6, 7)
S. anomala (Pers.) Fr. var. *ochracea* (Hoofm.) Berk. (not in B. & G. under vars. of 264, p. 164) (5)
Stereum hirsutum (Willd.) Fr. (*ibid.* 594, p. 370) (4, 5, 6, 7, 8, 9, 10, 31, 33)
S. rugosiusculum Berk. & Curt. (*S. purpureum* Pers. 609, p. 379) (4, 6, 9)
S. rugosum (Pers.) Fr. (*ibid.* 601, p. 375) (4, 5, 6, 7, 8, 17b, 31, 33)
S. sanguinolentum (A. & S.) Fr. (*ibid.* 599, p. 373) (4, 5, 6, 7, 17b)
S. spadiceum Fr. (*S. gausapatum* Fr. 600, p. 374) (3, 4, 5, 6, 7, 17b)
Trametes rubescens (A. & S.) Fr. (*ibid.* 895, p. 590) (5)
Typhula erythropus (Bolt.) Fr. (*ibid.* 210, p. 129) (4)

GASTEROMYCETALES (Nomenclature follows Carleton Rea, 1922)
Bovista plumbea Fr. (4, 6, 17b)
Crucibulum vulgare Tode (4, 6, 10, 31)

Cyathus striatus (Huds.) Pers. (4)
Geaster fornicatus (Huds.) Fr. (27)
Lycoperdon caelatum (Bull.) Fr. (4, 10)
L. depressum Bon. (4, 6)
L. giganteum (Batsch.) Pers. (30)
L. nigrescens Pers. (9)
L. perlatum Pers. (4, 6, 9)
L. pyriforme (Schaeff.) Pers. (6, 8)
L. pyriforme var. *excipuliforme* Desmaz. (4)
L. pyriforme var. *tesselatum* Pers. (4)
L. umbrinum Pers. (4, 6)
Mutinus caninus (Huds.) Fr. (4, 5, 6, 9, 10, 27)
**Nidularia denudata* Fr. (9, 14, 35) on *Fagus sylvatica*
**N. minutissima* Palmer (9, 14, 35) on *Juncus effusus*
Phallus impudicus (Linn.) Pers. (4, 5, 6, 9, 10, 17b)
Scleroderma aurantium Pers. (4, 6, 9, 10, 18)
S. verrucosum (Vaill.) Pers. (4)
Sphaerobolus stellatus (Tode) Pers. (4, 5, 6, 7, 9)

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CORRESPONDENCE

DEAR SIR,

Races and plumages of Guillemots

Mr. John Mather surely deserves to be congratulated on his enterprise in exploring a neglected subject in his paper 'The occurrence of the Northern Guillemot (*Uria aalge aalge*) in Yorkshire Waters' (*Naturalist*, 81–4, 1966), but there are surely also some points raised by previous authors that he should have considered.

In the first account of a large wreck of oiled birds in Holland in 1921–2 J. Verwey (*Ardea* 11: 99) observes that the spring moult starts progressively later with increasing age, occurring from late February to late May in yearlings, about a month earlier in two-year-olds, and at times actually overlapping with the end of autumn moult in November in adults. Since young birds appear to be more highly migratory than adults according to ringing analyses such as the British one by A. L. Thomson (*British Birds*, 46: 3–15) it follows that there is likely to be a much higher proportion of young birds among northern Guillemots wintering off Yorkshire than among the local stock which fail to migrate, and therefore that the delayed moult of northern birds reported by Mr. Mather and illustrated in his figure 2 is probably more a sign of immaturity than of their origin.

Secondly, while Mr. Mather reports that streaking on the flanks is 'the best character on which to determine the races of birds found on beaches', spotting of the underwing, which had been used as a character for a supposed Faroe race *U. a. spiloptera*, and which is associated with it, was found by R. W. Storer in his classic study of the variation of auks (*Univ. Cal. Publ. Zool.* 52, table 30) to be a widespread variation in many eastern North Atlantic populations, so that it seems likely that it is not racial but individual variation which Mr. Mather illustrates in Figure 3. On occasion birds are completely dark below.

In fact, the determination of the races of Guillemots seems to depend more upon colour of the back in the south and upon size in the north. In a further study of wrecked Dutch birds K. H. Voous (*Limosa* 21: 12–14) found not only 32 birds referable to the southern race *U. a. albionis*, 15 intermediates, and 20 belonging to the nominate race *U. a. aalge*, but also one exceptionally large one apparently referable to the Arctic race *U. a hyperborea* from the Barents Sea; and birds of this race ringed on the Murman coast have also been recovered in winter in south Norway and Denmark, and one in Co. Durham (*British Birds*, 59: 95). Unfortunately although they may be quite common the description of northern birds provided by Mr. Mather will not exclude them.

It seems unfortunate that Yorkshire ornithologists are in several important cases so reluctant to join in attempts to organise the study of this subject on a wider scale, if only because it seems doubtful if they will make much progress without a proper consideration of the results of work elsewhere. The north-east coast is a key area for the study of wintering birds from the Arctic, and we urgently need more critical information from it.

W. R. P. BOURNE

Hon. Secretary, The Seabird Group, c/o British Ornithologists' Union, British Museum (Natural History), Cromwell Road, London S.W.7.

Dear Sir,

Birds and Anglers

On reading C. G. Booth's field note on this matter in the last issue of *The Naturalist* (July–September, 1967, p. 80), I am prompted to report the following instance which indicates that it is not only typical waterside birds or gulls that can be deleteriously affected by fishing line discarded by anglers.

Whilst ringing in a small, marshy area adjoining Wintersett Reservoir, near Wakefield, on the 2nd July, 1966 I found a dead, adult male Blackbird (*Turdus merula*), which had been ringed there by me in June 1964, suspended in a hawthorn bush by a three foot length of nylon fishing line caught around its neck several times. An attached hook had caught in the bush and the bird had, in attempting to release itself it seemed, struggled so much that the line had tightened sufficiently around its neck to effect strangulation. Presumably the bird had gained this line, initially, whilst feeding alongside the reservoir or by getting entangled in it after it had been discarded into the surrounding undergrowth.

As Mr. Booth points out, this is a serious menace but one which, with a little forethought by the angler, could be largely eradicated as an introduced hazard amongst the many natural ones already affecting the lives of birds.

J. S. Armitage.

A RESTING STAGE IN *CYCLOPS DYBOWSKII* LANDE (CRUSTACEA; COPEPODA)

W. J. P. SMYLY

Harding and Smith (1960) list three British species of the sub-genus *Mesocyclops*. Resting stages of two of these species, *Cyclops leuckarti* Claus (Fryer and Smyly, 1954) and *Cyclops hyalinus Rehberg* (Smyly, 1964), and of a fourth species not recorded in Britain, *Cyclops oithoinoides* (Sars), (Elgmork, 1958), have been described. The third species on the British list, *Cyclops dybowskii* (Lande) was found as adults in summer-time in the open water of fourteen tarns of the English Lake District in a survey made in 1953–6 (Smyly, 1958). It was decided to revisit some of these tarns in winter to see if a resting stage of this species could be found. Two tarns, Tewet (Nat. grid ref. 35/304237) and Crook Reservoir (Nat. grid ref. 34/445957) were chosen because in them the species had been caught in abundance in summer in tow-net samples. Both tarns have a maximum depth of about one metre and a surface area of about 10,000 sq. m.

Bottom samples were taken with a metal cylinder, 24 cm. long, and 5.4 cm. in diameter; when lowered vertically to the bottom, it sampled an area of approximately 23 sq. cm. The lower rim was sharpened to form a cutting edge to make it easier to drive the tube into the mud. The upper rim was fitted with a detachable lid, which allowed the water to pass through it as it went down but closed after contact with the bottom. With this device, it was possible to take a core of mud together with a column of overlying water. Most of the water was decanted through a fine mesh gauze (100 threads to the inch) and any animals caught on it preserved for later examination. The mud cores, of which twenty were taken at each tarn, were kept separate from the water samples and dealt with by a flotation technique. Concentrated magnesium sulphate was added to the mud which was then well shaken, and after allowing time for heavy particles to settle out the surface material was collected by decanting the fluid through fine gauze.

Individuals of *Cyclops dybowskii* were found in all the samples from Crook Reservoir and in more than half those from Tewet Tarn. The specimens were found almost entirely in the samples from the mud; the few which were found in the samples of overlying water were perhaps accidental as the method used in the field for separating the water from the mud was decidedly crude. All the animals found were in the fourth copepodid stage and there was no cyst. Numbers were small and ranged from 1–8 with a mean of 5.7 in Crook Reservoir and 2.6 in Tewet Tarn; these means are equivalent respectively to 251 and 114 per sq. m. While most of the copepodids were extracted from the mud by flotation, a few were found by direct search. These latter had no food in their guts and did not respond to touch. They became active again after several hours at 16°C.

Fourth stage copepodids of this species have also been found occasionally in small numbers in preserved samples from the mud in the deeper parts of two lakes, Esthwaite Water and Rydal Water, between October and April. Adults however have not been recorded from the plankton of either of these lakes. Rylov (1948) describes the species as an inhabitant mainly of the littoral zone of lakes and from various shallow waters where there is vegetation. Gurney (1933), speaking of its occurrence in Britain, says that it is generally confined to small ponds.

The copepodids of *C. dybowskii* referred to in this paper were taken in March, 1966 and January, 1967. As far as I know these are the first records of this species having been found in winter. The other three species of *Mesocyclops*, for which resting stages have been described, also have a resting stage in the winter.

In all four species of *Mesocyclops*, the animal overwinters in either the fourth or fifth copepodid stage. It appears that *C. dybowskii* and *C. hyalinus* overwinter only in the fourth copepodid stage, *C. oithoinoides* only in the fifth copepodid stage but *C. leuckarti* may do so in both stages, the proportion of each stage depending on locality.

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Nesting Birds, Eggs and Fledglings by **Winwood Reade** and **Eric Hosking.** Pp. 275 with 209 plates (168 in colour), 19 plates of eggs and numerous diagrams and text-figures. Blandford Press. 25/-.

The spate of books for bird-watchers continues and it is sometimes difficult to find a good reason for their publication. The justification for this book is clearly that it presents a comprehensive collection of Mr. Hosking's remarkable colour photographs of the principal breeding birds of Northern Europe. Some of them, such as the photograph of the Hobby taken from a hide on the top of 64 feet of scaffolding — and in which a Field-Marshal had a hand — are old friends. But the quality of these photographs, many of which were taken with Kodachrome film when the colour balance was not nearly as good as it is at present, never ceases to impress. As the title suggests, the emphasis of the book is on breeding biology and whilst not breaking new ground Miss Winwood Reade presents the facts of this fascinating aspect of ornithology in an interesting manner. The 19 plates of eggs are by Portman Artists and are well done. The guides to species in various habitats and the black-and-white illustrations throughout the text are by Robert Gillmor and are both artistic and accurate. The book is described as a pocket encyclopaedia on the theme of birds at their nests and this is no exaggeration. D.F.W.

Penguin Dictionary of British Natural History by **Richard** and **Maisie Fitter.** Pp. 348. Penguin Reference Books. 8/6.

Contains approximately 4000 entries covering animals and plants and explanations and definitions of various physical, meteorological, geological and geographical words and terms relating to the natural environment. The species covered are all those with 'a vernacular name in general use', otherwise entries below the family level are not included. In the case of flowers any selection of popular names is certain to cause some eyebrow raising as each reader notes the omission of some well used names and the inclusion of others unknown to him. And so it is here where Herb Christopher is omitted but St. Olaf's Candlesticks qualifies for inclusion. In like manner many accepted popular names of moths are omitted. There is a complete index to the scientific names of all species included. This is not a book for the knowledgeable naturalist but will no doubt be of use to those with more generalised natural history interests.

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1967

HORTON IN RIBBLESDALE V.C. 64 — 27th to 29th May

After a first day of poor weather and a discouraging morning on the second, the meeting was comparatively fortunate for the rest of the time. Twelve members were resident at Headquarters. On the first two days a total of twenty-five members were present and thirty on the last day.

The excursion to Penyghent on the Saturday was curtailed, as far as recording was concerned, by heavy rain, but several intrepid members reached the summit. On Sunday, one party spent the day on Moughton Fell and another went into the Dent–Sedbergh area. On Monday, bryologists visited Ling Ghyll, one party went to Colt Park Wood and one to the disused quarries at Arcow Wood and on to another part of Moughton Fell.

Dr. Sledge took the Chair at the final meeting when reports were presented. Fifteen societies were represented and 42 new members were elected. Mrs. Haythornthwaite proposed a vote of thanks to the Divisional Secretary for the arrangements for the meeting and to landowners who had granted parking facilities.

Vascular Plants (W. A. Sledge): Rain put an early end to botanical activities for most of the party on Saturday though not before *Saxifraga aizoides* (Yellow Saxifrage) had been seen at its old station at Hunt Pot. The few hardy ones who proceeded to the top of Penyghent saw *Saxifraga oppositifolia* (Purple Saxifrage) on the cliffs though past flowering.

Conditions showed little improvement on the Sunday morning and several members made off by car to Dent and Sedbergh. Those who set off for Moughton Fell were rewarded both by an improvement in the weather and by seeing *Listera cordata* (Dwarf Twayblade) and *Polystichum lonchitis* (Holly Fern).

On Monday, which was fine and sunny, the botanists split into three groups. One party went down the river on the west side to Arcow and thence back over Moughton Fell. Both species mentioned above as having been seen on Moughton Fell on the previous day were seen again and in different places. *Arenaria norvegica* ssp. *anglica* (*A. gothica* auct. angl.) was also seen at Arcow and much *Botrychium lunaria* (Moonwort). Those who visited Colt Park Wood saw *Actaea spicata* (Baneberry) and *Viola lepida* together with other species well known in this locality. The Ling Gill party did not report any species not generally distributed in the district or known to occur in the gill.

The only species seen during the week-end which are not recorded from the 34/87 square in the Atlas were *Allium oleraceum* (Field Garlic), near the river below Horton, and *Cardamine amara* (Large Bitter-cress) by the river immediately above the bridge in Horton village.

Bryophytes (F. E. Branson): The bryological party visited Ling Gill on Monday. Only a very short distance was examined, but the bryophytes were prolific and a long list of species resulted. A selection of the more interesting species is given in this report. Mrs. Gow made an important confirmation by finding the hepatic *Nowellia curvifolia* on an ash tree overhanging the stream and I am also indebted to her for the records of the mosses *Barbula rigidula*, *Barbula spadicea*, *Gymnostomum calcareum*, *Orthotrichum cupulatum* and *Seligeria acutifolia* var. *longiseta* among many others. The walls at the side of the track approaching the gill from High Birkwith produced some interesting mosses including *Neckera complanata*, *Leucodon sciuroides*, *Barbula cylindrica*, *Tortula ruralis* (fruiting), *Grimmia apocarpa* and *Ditrichum flexicaule*. (I also found this again on a slope above the gill.) At the side of this track, on the ground, I also collected *Cirriphyllum crassinervium*, *Rhacomitrium canescens*, *Trichostomum crispulum*, *Climacium dendroides* and three species of *Sphagnum* which Miss Dalby has determined as *Sphagnum palustre*, *S. subsecundum* var. *subsecundum* and *S. compactum*.

The limestone cliffs were a great attraction and had much fruiting *Plagiopus oederi*, some fine *Neckera crispa* fruiting, *Fissidens cristatus*, *Trichostomum brachydontium* and the hepatics *Preissia quadrata*, *Metzgeria pubescens* and *Scapania aspera* (very abundant). Finally, in and about the gill I collected the following: *Lejeunea cavifolia*, *Plagiochila asplenioides* var. *asplenioides*, *Solenostoma triste*, *Isothecium myurum*, *Isothecium myosuroides*, *Ctenidium molluscum*, *Dicranum majus*, *Gymnostomum aeruginosum*, *Tortella tortuosa*, *Fissidens adiantoides*, *Pleurozium schreberi*, *Cirriphyllum* *piliferum, Rhytidiadelphus triquetrus, Fontinalis antipyretica, Drepanocladus uncinatus, Grimmia alpicola* var. *rivularis*, and *Mnium marginatum* var. *marginatum*, the last three with capsules.

Nomenclature follows the *Census Catalogue of British Mosses* (3rd ed.) and *Census Catalogue of British Hepatics* (4th ed.).

Ornithology (A. C. M. Duncan): On the Saturday we had intended to climb Penyghent, but owing to the deterioration of the weather, few reached the top. Quite a number of moorland birds were listed however amongst which were Golden Plover, Dipper and Ring Ouzel, the latter possibly with nest.

On the Sunday, during the walk over Moughton Fell to Crummock Dale, Wheatear, Linnet and Carrion Crow were added to the list.

On Monday we followed the river down to the quarries. Here we found Redshank nesting. A colony of Sand Martins was passed on the way.

It was good to know that Raven and Buzzard were still in the district, although higher up the valley. Kestrel were also seen.

The following species were recorded during the weekend: Buzzard, Kestrel, Red Grouse, Pheasant, Oystercatcher, Lapwing, Golden Plover, Snipe, Curlew, Redshank, Lesser Blackbacked Gull, Herring Gull, Blackheaded Gull, Cuckoo, Tawny Owl, Swift, Skylark, Swallow, House Martin, Raven, Carrion Crow, Rook, Jackdaw, Blue Tit, Wren, Dipper, Mistle Thrush, Song Thrush, Ring Ouzel, Blackbird, Wheatear, Redstart, Robin, Sand Martin, Whitethroat, Willow Warbler, Meadow Pipit, Pied Wagtail, Starling, Greenfinch, Goldfinch, Linnet, Redpoll, Chaffinch, House Sparrow.

HUGGATE V.C. 61 — 10th June

Excellent weather conditions favoured this meeting in the Wolds which was attended by thirty-one members representing twelve societies. In the unavoidable absence of Miss Crackles, the Divisional Secretary, in the morning, the party was led by Mr. Eric Chicken.

In the morning we visited Greenwick Wood and Quarry, in a dry chalk valley, and Huggate Dikes and went on after lunch to Millington Dale. On the site of the old Millington Woods the widespread ill effects on the plant life there of weedkillers sprayed on adjacent arable fields, was observed. Members thought that the combined results of this and the felling of most of the tree cover, would have an adverse effect on the small amount of *Actaea spicata* still present.

At the meeting after tea, the Chair was taken by Mr. R. F. Dickens. Miss Kordik gave a vote of thanks to Miss Crackles for the excellent arrangements made, to Mr. Chicken for acting as leader during the day, and to the local landowners for granting access to their property. Mr. Dickens particularly expressed the thanks of the Union to Miss Crackles, who is retiring this year as Divisional Secretary for V.C. 61, for all the enthusiastic work she has done in this capacity in recent years.

Vascular Plants (Mrs. F. Houseman): The botanical section was strongly represented at this meeting. A variety of habitats were visited during the day, but no new plants were recorded and several plants listed in the circular were not seen, though a number of interesting species were noted.

The morning was spent in Greenwick Wood and Huggate Dikes. First, rough grassland near the entrance to the wood was investigated. *Crepis capillaris, Galium verum, Galium mollugo, Knautia arvensis, Centaurea scabiosa, Hypericum hirsutum* and *Pimpinella saxifraga* were seen here.

In the woodland, part of which was just recovering from reafforestation, a few plants of *Arabis hirsuta* were growing by the path. *Circaea lutetiana*, *Geranium robertianum* (both pink and white flowered varieties), and *Myosotis arvensis*, were in abundance and several plants of large, double petalled *Ranunculus repens* L., were seen. On heathy slopes at the end of the wood, *Linum catharticum*, *Carduus nutans*, and *Thymus drucei*, were added for the area.

Huggate Dikes were next explored. Here were *Cerastium arvense*, *Poterium sanguisorba, Betonica officinalis, Helianthemum chamaecistus, Polygala vulgaris, Trisetum flavescens*, *Helictotrichon pubescens* and *H. pratense*, but not *Sieglingia decumbens*. At the entrance to a wood nearby, *Geum intermedium* was plentiful, with both parents. Of the latter, *Geum urbanum* was most in evidence.

In the afternoon, Millington Woods and Millington Springs yielded several additional plants to those seen earlier in the day. As there had been extensive felling of ancient woodland, changes had occurred. Two plants of *Actaea spicata* and a few medium-sized bushes of *Rhamnus catharticus* were confirmed. Ferns were scarce and *Dactylorchis fuchsii* and *Listera ovata* were the only orchids seen. *Campanula latifolia Viola reichenbachiana, Galium odoratum,* and leaves only of *Convallaria majalis,* were other good plants in the wood. Millington Springs, being a damper part of the area, produced *Carex acutiformis, Carex hirta, Blysmus compressus, Juncus compressus, Veronica beccabunga,* and the double petalled variety of *Cardamine pratensis, Geranium sanguineum* and *Cirsium eriophorum* were seen in the district by a few members.

Nomenclature follows Dandy's *List of British Vascular Plants* (1958).

Bryology (F. E. Branson): There was a scarcity of bryophytes, as is usual on the dry chalk of the East Yorkshire wolds, but those collected included some interesting species.

The first moss which I collected from a tree branch by the roadside near a small dewpond, not far from Greenwick Wood was *Brachythecium salebrosum,* a new record for V.C. 61 which alone made the excursion worthwhile. A walk along a dry valley in this vicinity only produced four mosses, viz.: *Rhytidiadelphus squarrosus, Acrocladium cuspidatum, Mnium undulatum* and *Brachythecium rutabulum* all from among the short turf of pasture and all very common species. *Funaria hygrometrica* from a roadside, *Pseudoscleropodium purum* and *Campylium chrysophyllum* from Greenwick Wood completed the list of mosses from this area. Mr. Shaw and I then went on to Millington Springs where the marshy ground by the side of the stream near the road was more productive. Here the dominant moss was *Cratoneuron filicinum,* much of it with capsules. Other species from the marsh were *Cratoneuron commutatum* var. *commutatum, Acrocladium cuspidatum, Barbula tophacea, Brachythecium rivulare* and *Mnium hornum.* Miss J. Robertson handed me the only two hepatics seen during the day, *Riccardia pinguis* and *Lophocolea bidentata* and the mosses *Isothecium myurum* and *Brachythecium velutinum.* My thanks are due to Mrs. J. Appleyard for determining the new V.C. record.

Miss Robertson also visited Greenwick Dale and the old chalk quarry there. In this area she found *Seligeria calcarea,* and the rare *Seligeria paucifolia* occurring very frequently on loose chalk pebbles in various places. In the old quarry were *Phascum cuspidatum, Bryum inclinatum, Barbula fallax* and *Aloina brevirostris,* the last not recorded in V.C. 61 since the last century. In Millington Springs she found *Philonotis calcarea* and from the bank above, a new record for V.C. 61, *Thuidium philiberti.* Miss Dalby and Mr. Shaw very kindly checked these last specimens.

Nomenclature follows the *Census Catalogue of British Mosses* (3rd ed.) and the *Census Catalogue of British Hepatics* (4th ed.).

Ornithology (B. S. Pashby): The Ornithological section was well represented and was able to cover the following areas: Greenwick Dale (including Great Plantation), part of Frendledale, a small dale leading out of the latter up to Huggate Dikes, Millington Wood and a fleeting visit by four members to the northern end of Golden Valley. The local Wolds species mentioned in the circular, Wheatear, Redstart, Whinchat and Tree Pipit were all recorded, the latter being fairly common. Curlews were heard in several places and a party of six were seen to fly across the valley of Frendledale. The presence of three species: Grasshopper Warbler, Sedge Warbler and Reed Bunting all in a dry area of Greenwick Dale was remarked upon, though regarding the two latter species, this is not unusual in East Yorkshire. Blackcaps, Garden Warblers, Willow Warblers and Whitethroats were all present in the Greenwick Plantation as well as in other suitable areas. Turtle Dove, Red-Legged Partridge, Cuckoo and Spotted Flycatcher were seen and many Goldfinches, Redpolls and Yellowhammers in all areas. Of the Tit family, only the Great and Blue were recorded and a party of Long-tails in Golden Valley and of the Crows, only Rook and Jackdaw.

Male and female Kestrels were hunting over Millington Pastures where in the valley bottom two or three pairs of Lapwings had young. Nests seen were those of Rook (a rookery at Greenwick), Partridge (17 eggs), Whinchat (6 eggs), and Redpoll. After the meeting C. Disbrey saw two Quails about two miles east of Huggate, almost at the same place as two seen by P. J. Boylan on the 6th June.

Other species seen were Pheasant, Common Gull, Woodpigeon, Swift, Skylark, Swallow, House Martin, Wren, Song Thrush, Blackbird, Robin, Goldcrest, Dunnock, Meadow Pipit, Pied Wagtail, Starling, Greenfinch, Linnet, Bullfinch, Chaffinch, Corn Bunting, House and Tree Sparrows, making a total of 51: a very good result for the Wolds area.

Mammals and other Vertebrates (C. Simms): Rabbit, Hare and Stoat were seen during the day, the first two in several places.

The amphibians recorded were Common Frog (adult in Millington Springs, tadpoles in the dew pond near Huggate Dikes), and Smooth Newt in the dew pond also, where they were abundant.

Sticklebacks and eels were seen in Millington Springs.

Entomology (R. Crossley): In spite of the ideal weather conditions for collecting hoverflies there were not very large numbers in any of the localities visited and the twenty or so species identified have all proved to be very common and widespread insects which will excite no one. This may only have been a reflection of the poor early part of the collecting season generally, which this year has been very disappointing. Only one species is worthy of mention and that is *Cheilosia maculata* Fall. This hoverfly is usually associated with Ramsons (*Allium ursinum*) and can normally be commonly found wherever the plant grows. It was not, therefore, surprising to see several specimens on the slopes in Millington Woods, but for some curious reason the species has not been recorded previously in V.C. 61.

Mr. Payne kindly gave me specimens of water bugs which he obtained from the dew pond near Huggate Dikes and again these proved to be common species, but in view of the general scarcity of such habitats on the chalk, the list is worth noting: *Corixa punctata* (Illiger), *Hesperocorixa sahlbergi* (Feiber), *Sigara distincta* (Feiber), *S. nigrolineata* (Feiber), and *S. limitata* (Feiber). The pond also contained very many nymphs of *Notonecta* spp., probably *glauca L.* and the pond skaters on the surface were all *Gerris thoracicus* Schummel.

GREAT AYTON AND KILDALE V.C. 62 — 17th June

Twenty members, representing seven societies, were present for this enjoyable day in North Cleveland. The ornithologists and entomologists were not represented and conditions were very dry for bryology, but the other botanists saw much of interest and all in glorious weather.

Mr. C. Simms writes of the landforms in the district: 'The wide and steepsided form of Kildale and its deep tributary, Lounsdale, owe much to glacial or fluvio-glacial action. The Esk valley of Tertiary times (running east at a much higher level than today), was continuous with the main west-east valley of Kildale, when Lounsdale was a north bank tributary. The direct effects of any glaciers in the area during the Ice Ages are problematical, but the notch in the ridge north-west of the head of Lounsdale (Gribdale Gate 592 111), was clearly cut by meltwaters from ice over the Cleveland Plain which would contribute to a 'Lake Kildale' in the Eskdale series of pre-glacial lakes which eventually drained south to the Vale of Pickering via Newtondale.

Subsequently, the Leven has cut back from the Tees to successfully rob the Esk of some of its headwaters in the Kildale area; the elbow of capture is a marshy col below Percy Rigg (634 095). With such a history it is not surprising that Kildale and Lounsdale have floors choked with fluvio-glacial deposits, including many Cheviot erratics from the land ice to the north, in part overlain by landslip products and recent alluvium. In the valley floors exposures of the Deltaic country rock are rare and drainage poor.'

In the morning, we walked from Gribdale Gate along the edge of Easby Moor and Court Moor past Capt. Cook's Monument, then dropped down towards the flooded quarry in the whinsill known as Great Fern Deep, in Kildale. We returned to our starting point via the valley on the northern side of Court Moor, in which we found one or two interesting springs.

At the Meeting for Reports after tea, the Chair was taken by Miss C. Rob. Mr. E. Chicken proposed a vote of thanks to Mr. I. Lawrence, the Divisional Secretary for V.C. 62, for planning and making the arrangements for the day, and to landowners who had granted us access to their property.

Vascular Plants (Miss D. R. Walker): The first part of the walk from Gribdale Gate was through newly planted ground, which carried a flora of *Calluna, Empetrum* and Bracken. The area covered by the meeting took in portions of three 10 km. squares.

Eleven additions were recorded to the Great Ayton square, five to the Baysdale square and over 60 to the Guisborough square. Included in the 60 were *Dryopteris borreri, Alchemilla glabra, Corydalis claviculata, Epilobium obscurum* and *E. palustre, Lemna trisulca, Myosotis caespitosa, Dactylorchis fuchsii, Ranunculus hederaceus, Typha latifolia* and *Carex laevigata*. Over the three 10 km. squares six sedges were added to the records.

Whilst *Trientalis europaea* was not new to the area, having been recorded previously from Baysdale, nevertheless it was pleasing to find it both in good quantity and in good condition. The most interesting areas visited were an old quarry, now flooded, in the Cleveland Dyke, and a small area of boggy ground which yielded *Carex laevigata* and *Ranunculus hederaceus*. The hybrid between Bilberry and Cowberry was not seen and it would appear that a very exhaustive search will be required to refind this plant, particularly as Cowberry was not recorded during the meeting.

Bryophytes (J. Robertson): Only common species, to be expected in the habitats visited, were seen. Conditions were generally very dry for collecting.

Sphagnum recurvum and *Polytrichum commune* filled the few damp ditches on Easby Moor. *Pleurozium schreberi* was intermixed with the *Calluna* in many places and on peaty, stony soil along the track, *Pleuridium acuminatum, Dicranella heteromalla, Dicranum scoparium, Orthodontium lineare* and *Pohlia nutans* occurred. In damp places in a small quarry on this moor the hepatics *Calypogeia trichomanis, Lophozia ventricosa, Gymnocolea inflata, Lepidozia reptans, Cephalozia media* and *Diplophyllum albicans* were found. In grassland *Rhytidiadelphus squarrosus* occurred often. In the small area of bog round Great Fern Deep, *Cratoneuron filicinum, Acrocladium cuspidatum,* and *Pellia* spp. abounded and on old stone walling near there the rupestral species *Tortula muralis, Pottia lanceolata, Grimmia apocarpa* and the rather uncommon *Orthotrichum anomalum* were seen. *Isopterygium elegans* flourished in various sites on shaded banks.

I am indebted to Miss Dalby and Mr. Branson for kindly checking this material.

The nomenclature used is that of the *Census Catalogue of British Mosses,* Warburg (1963), and *Census Catalogue of British Hepatics,* Paton (1965).

OVINGTON FOR BRIGNALL BANKS and the adjacent district

V.C. 65 — 8th and 9th July

We were again blessed with excellent weather for this two-day meeting. On the Saturday, a party of over twenty explored Brignall Banks, beside the Greta, and on the Sunday we visited the village of Barningham and the woods round Barningham Hall whilst in the afternoon a small group went further afield to Scar Ghyll.

About sixteen members, representing eleven member societies, were present for tea and reports on the Sunday, when the Chair was taken by Miss C. Rob.

A vote of thanks was proposed by Miss J. Robertson to Mrs. J. Holloway for her work in preparing this very interesting weekend, and to Sir Mark Millbank, the local landowner, for kindly granting us access to his land.

Vascular Plants (Miss R. Kilby and Miss C. Rob): The wooded valley of the river Greta, known as Brignall Banks, has not often been visited by the Union. There is, however, a fairly complete list of plants given in Baker's Flora; many of these are early flowering species which were past flowering at this date.

On the first day the flora was a mixture of plants of limestone and more acid conditions: amongst the ferns seen were *Blechnum spicant* and *Thelypteris oreopteris. Arabis hirsuta, Galium boreale, Crepis paludosa, Geranium sylvaticum, Thymus drucei* and *Hypericum pulchrum* were seen and *Scirpus setaceus* occurred in at least one wet place. Other sedges included *Carex lepidocarpa, C. flacca, C. nigra, C. echinata* and *C. ovalis*. Additional plants noted included *Myosotis sylvatica, Poa nemoralis, Milium effusum, Dactylorchis fuchsii, Listera ovata, Geum intermedium, Cirsium heterophyllum, Blysmus compressus, Veronica montana, V. scutellata, Viola lutea* and *Cardamine amara*.

Mrs. F. Houseman, reporting on the second day says: 'The Sunday was devoted to the Barningham area. Privately owned woodland was explored in the morning. Nearly all the species noted were typical of their habitats, so few call for comment.

Cystopteris fragilis was in fair quantity in the mortared walls around the Hall and at the entrance to the woods, *Claytonia alsinoides* flourished. *Luzula sylvatica* and

Lysimachia nemorum were fairly frequent and *Corydalis claviculata* trailed amongst the bracken. Huge plants of *Vaccinium myrtillus* were almost barren of flowers or fruit. Nearer the Hall, at the edge of the woodland, *Lilium martagon,* two of which were white specimens and *Lilium pyrenaicum* — doubtless garden outcasts — were seen, and *Equisetum telmateia* was by the beck. In a marshy part of a field near the wood were *Cardamine amara* and *Myosotis caespitosa.*

The beauty of the trees in the woodland was commented upon, particularly the elegant, straight Larches. Several fine old Elders were a mass of bloom and the heavy perfume had attracted hundreds of bees and other insects.

In the afternoon several members explored Scar Ghyll, where they were confronted by a fantastic sight: the devastation of all the Bird Cherry, which was entirely encased in a plastic-like film composed of the web of the communal larvae of a moth, as were other plants beneath them. In the wood by the stream, were *Stellaria nemorum, Geranium sylvaticum, Crepis paludosa, Campanula latifolia, Carex remota, Valeriana officinalis* and *Geum intermedium* with both its parents.

Other members explored the hedgerows and lanes and found *Lathyrus montanus, Dactylorchis fuchsii, Salix pentandra* and *Hypericum pulchrum, Verbascum thapsus* and *Phyllitis scolopendrium.*'

Bryology (Miss M. Dalby): Bryologists were out in force for the excursion to Brignall Banks and a most rewarding day was enjoyed by all. A variety of habitats varying from the fairly acid woodland and boulders of the R. Greta to a limestone quarry on the hill above resulted in an excellent list of records. The best find was Mrs. Gow's discovery of *Orthotrichum rivulare* on boulders in the river, a species not recorded in V.C. 65 since the early years of the century. *Cinclidotus fontinaloides* was also fruiting well on these boulders. On an ash root near the path down to the river *Frullania tamarisci* and *F. dilatata* grew together with *Metzgeria furcata,* and nearer the river *Drepanocladus uncinatus* fruited in profusion. *Dicranoweissia cirrata* was also found here with both fruits and gemmae. On boulders near the river on the right hand bank were *Scapania aspera* and *S. umbrosa* and a low sandstone cliff yielded *Amphidium mougeotii.* A limestone quarry on the hill above visited by Messrs. Shaw, Branson and Thompson produced such typical calcicoles as *Encalypta vulgaris* with fruit, *E. streptocarpa, Grimmia apocarpa* and in addition *Orthotrichum cupulatum, O. anomalum* and *Hypnum cupressiforme var tectorum.*

Additional species are listed below:—

Sphagnum capillaceum
Atrichum undulatum
Polytrichum juniperinum
P. formosum c.fr.
Fissidens bryoides
F. taxifolius
Ceratodon purpureus
Dicranella heteromalla
Dichodontium pellucidum
Dicranum fuscescens
D. majus
D. scoparium
Campylopus flexuosus
Leucobryum glaucum
Tortula intermedia
T. muralis c.fr.
Barbula unguiculata
B. trifaria
Gymnostomum aeruginosum
Eucladium verticillatum
Grimmia trichophylla
Rhacomitrium aciculare c.fr.
R. canescens
Tetraphis pellucida
Orthodontium lineare c.fr.
Pohlia wahlenbergii
Bryum capillare
Mnium hornum
M. cuspidatum
M. undulatum
M. punctatum
Neckera complanata
Thamnium alopecurum
Thuidium tamariscinum
Cratoneuron commutatum
Amblystegium serpens
Hygrohypnum luridum
Acrocladium cordifolium
A. cuspidatum
Isothecium myosuroides
Camptothecium sericeum
Brachythecium rutabulum
B. rivulare
B. plumosum
Cirriphyllum crassinervium
Eurhynchium striatum
E. praelongum
E. praelongum var *stokesii*
E. riparioides
Pseudoscleropodium purum
Pleurozium schreberi
Isopterygium elegans

Plagiothecium denticulatum
P. succulentum
P. sylvaticum
P. undulatum
Hypnum cupressiforme
H. cupressiforme var *ericetorum*
Ctenidium molluscum
Rhytidiadelphus squarrosus
Conocephalum conicum
Pellia epiphylla
Lepidozia reptans
Calypogeia muellerana
C. fissa
Lophozia ventricosa
Barbilophozia attenuata
Solenostoma triste
Lophocolea cuspidata
L. heterophylla
Chiloscyphus polyanthos
Cephalozia bicuspidata
Diplophyllum albicans
Scapania undulata

Barningham Park Wood visited on the Sunday was not quite so rewarding but a patch of old elders produced *Metzgeria fruticulosa, Aulacomnium androgynum, Plagiothecium curvifolium, Cephalozia media, Lophocolea cuspidata* and *Brachythecium velutinum.* Masses of *Leucobryum glaucum* were noted in one area and on the damp rides were *Pleuridium acuminatum* and *Pohlia delicatula.*

Confirmation has just been received (too late for mention in the body of the report above) that *Plagiothecium laetum* (new to the County) and *Plagiothecium latebricola* (new to V.C. 65), were also found on Brignall Banks by Miss Dalby.

Nomenclature follows the Census Catalogues — Mosses, Warburg (1963), and Hepatics, Paton (1965).

Plant Galls (F. B. Stubbs): Two birch trees near Barningham Hall had good examples of the 'Witches' Broom' (attributed to *Eriophyes rudis* Canest), including a few in an active early stage. Both the common mite galls on alder leaves, *Phytoptus alnicola* (syn. *Eriophyes axillaris*) and *P. brevitarsus,* were frequent. Many of the species which were expected did not appear, the oaks not even showing the Marble Gall. Others reflected the lateness of the season, with only a few small examples of *Perissia urticae,* on nettle, and *P. ulmariae,* on Meadow-sweet.

Ornithology (C. Simms): Mallard and Teal had broods on, or near, the Greta. A Kestrel, not seen by the recorders, was the only diurnal raptor recorded. Partridge and Pheasant were seen at Brignall and Ovington. Moorhen and Lapwing had broods above Brignall Banks and Curlew had bred near Barningham. Common Sandpipers were seen at three places along the Greta and at one on the Tees near Wycliffe. Herring Gulls and Blackheaded Gulls were seen overhead at Brignall. Barn Owl and Tawny Owl were heard about Ovington. Swifts, Skylarks, Swallows and House Martins were abundant and the following corvids were seen: Carrion Crow, Rook, Jackdaw, Magpie and Jay. Great, Blue, Cole and Marsh Tits were all found at Brignall Banks, but the Nuthatch, expected there and also at Barningham, was seen only at Wycliffe.

Tree Creepers and Wren were common in all woodland. Dippers were noted only at three places along the Greta. Mistle Thrushes were scarce, but Song Thrushes and Blackbirds were abundant. Whinchats were seen at Barningham where (as elsewhere) Redstarts were characteristic of the woodland edge and Robins of the interior. Of the Warblers, Grasshopper Warbler, Blackcap, Whitethroat, Willow Warbler and Wood Warbler were listed, but the last-named was poorly represented. Goldcrests were found only at Barningham. Spotted Flycatchers were frequent along the Greta where there were also a few Pied Flycatchers. Hedge Sparrows were seen very often, Pied Wagtails occasionally and Grey Wagtails at only a few places along the Greta. The Starling and the finches, except for the Redpoll at Brignall Banks, were relatively scarce. Other finches listed were Greenfinch, Goldfinch, Linnet, Bullfinch and Chaffinch. Ovington added Yellow Hammer, Reed Bunting and House Sparrow.

Other Vertebrates (C. Simms): Saturday was spent in the wooded valley of the Greta, when P. J. Stead and the writer were the recorders. Sunday was divided between Barningham Wood in the morning, Beck Gill Woods and Wycliffe Wood on the Tees in the afternoon, when the writer was working alone. Ovington itself provided some additional records on Saturday evening from open arable land; otherwise only wooded country was worked.

FISHES. Only parts of the Greta and its feeders (as at Beck Hole), were worked. Trout were abundant, Gudgeon, Minnow and Stone Loach were present but the expected Miller's Thumb was not found.

AMPHIBIANS. No ponds were examined for larvae. Common Toads and Common Frogs were seen at Brignall Banks and Barningham Wood.

REPTILES. Conditions were good on both days. Although two old stations for slow worm were searched only the Common Lizard was found at Barningham and Wycliffe.

MAMMALS. Hedgehogs (road casualties) and molehills were a feature of the weekend, the only other Insectivora noted were Common Shrews (Brignall Banks and Barningham) and a Water Shrew in a pool of the Greta. Bats were not investigated. Stoats and Weasels were recorded only from a gamekeeper's gibbet at Barningham, where there was also spoor of Badger. The Brown Hare was seen once only, above Brignall Banks, where Rabbits were present in some numbers.

A Red Squirrel, at Barningham, was a very encouraging record. This species is said to be present in the Raby Woods and may also occur at Wycliffe. The Grey Squirrel, also present at Barningham, was surprisingly not seen at Brignall Banks. Woodmice (*Apodemus* sp.) were seen at Ovington and Barningham, but no material was handled. The Brown Rat was noted at Ovington, the Bank Vole at Barningham and the Water Vole only at Wycliffe. Rodents were not abundant anywhere. The Field Vole was only found at Barningham.

BROADHEAD CLOUGH, MYTHOLMROYD V.C. 63 — 23rd July

This Pennine meeting was held in excellent weather. About forty members were present during the day and twenty-three remained for the presentation of Reports after tea, when the Chair was taken by Mr. F. Murgatroyd. The Divisional Secretary, Mr. R. Crossley, was thanked for his preparatory work in organising the programme by Miss J. Robertson who also expressed the thanks of the Union to local landowners who had kindly granted access to their property.

The day was spent in and around Broadhead Clough and its surrounding moorland and in the evening, a small party went on to Withens Clough nearby.

Vascular Plants (Mrs. F. Houseman): The area visited is a Site of Special Scientific Interest. It was evident that in the old pastures considerable changes in the vegetation due to sheep grazing had taken place. The spread of *Nardus stricta* (Matgrass) and Bracken, continues. The plants and ferns were mainly those expected on acidic soils and most of the following were growing on the lower slopes; *Sieglingia decumbens* (Heath Grass), *Carex ovalis* (Oval Sedge), *C. panicea* (Carnation Sedge), *Juncus tenuis* (Slender Rush), *J. squarrosus* (Heath Rush), *Scirpus setaceus* (Bristle Club-Rush), *Carex flacca* (Glaucous Sedge), *C. demissa* (Common Yellow Sedge) and *Montia fontana* (Blinks). *Potentilla anglica* (Trailing Tormentil) was fairly plentiful but *Polygala serpyllifolia* (Heath Milkwort) and *Dactylorchis fuchsii* (Common Spotted Orchis), were scarce.

Most of the plants listed in the Circular for the damp Oak-Alder-Birch-Willow woodland were seen. *Carex laevigata* (Smooth Sedge) was fairly plentiful; *C. remota* (Remote Sedge), *Stellaria nemorum* (Wood Chickweed), *S. alsine* (Bog Stitchwort), *Lysimachia nemorum* (Yellow Pimpernel), *Equisetum sylvaticum* (Wood Horsetail), *Circaea lutetiana* (Common Enchanter's Nightshade) and *Viola palustris* (Marsh Violet), were amongst many interesting plants here. Ferns noted were *Thelypteris oreopteris* (Lemon Scented Fern), *Blechnum spicant* (Hard Fern), *Dryopteris spinulosa* (Narrow Buckler Fern), *Dryopteris dilatata* (Common Buckler Fern), *Dryopteris filix-mas* (Male Fern) and *Athyrium filix-femina* (Lady Fern).

The wet *Sphagnum* bog which covered a large area yielded *Dactylorchis maculata* subsp. *ericetorum* (Heath Spotted Orchis) in abundance, along with *Eriophorum angustifolium* (Common Cotton Grass) and *Hydrocotyle vulgaris* (Marsh Pennywort). In the drier parts surrounding the bog was *Melampyrum pratense* (Cow Wheat) growing amongst *Vaccinium myrtillus* (Bilberry). *Drosera rotundifolia* (Common Sundew) was reported from the moor at the head of the clough.

Those members who visited Withens Clough were rewarded by seeing a good variety of species. In the bog holes amongst large tussocks of *Molinia caerulea* were *Potamogeton polygonifolius* (Bog Pondweed), *Drosera rotundifolia* (Common Sundew), *Carex echinata* (Star Sedge), *C. pulicaris* (Flea Sedge), *Pinguicula vulgaris* (Common Butterwort), *Narthecium ossifragum* (Bog Asphodel), and *Menyanthes trifoliata* (Bog Bean).

It was remarked upon that *Rosa* spp. were scarce in the areas visited only a few bushes being seen. *Prunus spinosa* (Blackthorn) was present in one place but stunted and of poor growth. The whole area, ecologically, is well worth preserving.

An error occurred in the Botany notes on the Circular relating to *Scutellaria minor* (Lesser Skullcap), *Antennaria dioica* (Mountain everlasting), *Polygala vulgaris* (Milkwort), *Viola lutea* (Yellow Mountain Pansy), *Umbilicus rupestris* (Wall Pennywort). The reference to these plants should have been, 'The following species were formerly recorded but are not known at the present time. They could still be present and should be looked for.'

Bryophytes (J. Robertson): The woodland along the stream sides in Broadhead Clough and the acid bog at its head, proved the most fruitful hunting grounds. In the fairly dry ground under the trees *Eurhynchium praelongum, Orthodontium lineare, Ceratodon purpureus* var. *purpureus, Mnium hornum, Plagiothecium undulatum, Dicranella heteromalla, Campylopus pyriformis, C. flexuosus* and *Acrocladium cuspidatum* were frequent. On some old farm buildings were *Tortula muralis, Bryum capillare, Funaria hygrometrica* and *Dicranoweisia cirrata.*

In the bog at the stream's source, *Pohlia nutans, Polytrichum commune, Depranocladus fluitans, Acrocladium stramineum, Sphagmum subsecundum* var. *auriculatum, S. squarrosum*, and *S. recurvum* were collected.

The damp rocks near the stream bed were covered by hepatics (many not mature enough for identification), including *Cephalozia bicuspidata, Lepidozia reptans, Calypogeia trichomanis, C. fissa, Gymnocolea inflata* and *Diplophyllum albicans.* On these same rocks the mosses *Isopterygium elegans, Tetraphis pellucida, Mnium punctatum* and *Hyocomium flagellare* grew and in one spring, *Pohlia wahlenbergii.*

The bog in Withens Clough contained *Dicranella palustris, Depranocladus revolvens, Philonotis fontana, Mnium punctatum* and *Riccardia pinguis.* This area would no doubt produce many more records. Our time here was limited.

I am indebted to Miss Dalby and Mr. Branson for kindly checking some species.

The nomenclature used is that of the *Census Catalogue of British Mosses*, Warburg (1963), and the *Census Catalogue of British Hepatics*, Paton (1965).

Ornithology (I. Morley): Five observers visited a variety of habitats including woodland cloughs, upland pastures, the higher moorland and a Pennine reservoir.

As members assembled at Dauber Bridge, a Kestrel was observed hovering over a pasture, and Starling and House Sparrow were also noted. On entering Broadhead Clough, a pair of Jays flew past us and disappeared among the trees. In the Clough, Wood Pigeon, Blue and Great Tits, Blackbird, Redstart, Tree Creeper, Wren, Robin, Willow Warbler, Dunnock, Chaffinch, Redpoll, Linnet and Tree Sparrow were noted.

The upland pastures produced Mistle Thrush, Yellow Hammer, Skylark, Carrion Crow, and about twenty Magpies, whilst along the moor edges were Wheatear, Meadow Pipit and Twite. Curlews were calling as we crossed Bell House Moor to Withens Reservoir. Here, numerous Black-headed and a Common Gull were present with Lapwing, Dunlin and Common Sandpiper. We returned via Withens Clough to see House Martins still feeding young in their nests in the waterworks building. Swallows and a Reed Bunting were also noted and Lesser Black-backed Gulls passed overhead. Thirty-six species listed during the day was quite satisfactory for this rough Pennine country.

Mammals. The only mammals recorded were a rabbit and a dead mole.

Entomology (J. H. Flint): The fine sunny day was ideal for collecting insects but although several entomologists worked quite energetically nothing really outstanding was seen and most of the insects were common and generally distributed species. Of the more conspicuous species, plenty of Northern Spinach moths (*Lygris populata* L.) were flying in the shade of the trees at the upper end of the clough, while the striking hoverfly *Sericomyia silentis* Harris was common in the sunshine. Nymphs of the blue shield bug *Zicrona coerulea* L. were taken on heather. All these were to be expected.

The most interesting feature of the day's collecting was the discovery of colonies of solitary wasps on gritty slopes near the head of the clough. The steep sides of the valley make it a sun trap and the little black wasps *Crossocerus varius* Lep. were very active and difficult to catch. Three species of red and black spider-hunting wasps were taken, *Priocnemis minor* Zett., *P. obtusiventris* Schdt. (new to the vice-county) and *P. pusillus* Schdt. (the first to be recorded in the county since this group was split into several species by Haupt).

FIELD NOTE

A new locality for *Saxifraga hirculus* in Yorkshire

On the 18th June, 1967 I came across a good colony of *Saxifraga hirculus* growing at about 2,000 ft. on the upper slopes of Great Shunner Fell, between the head of Swaledale and Wensleydale, in North-west Yorkshire, V.C. 65. The plant was growing abundantly over the whole of a large calcareous flush, about half an acre in extent, and dominated by a spongy carpet of mosses, with a more open vascular plant layer, in which the following species list was made:

Anthoxanthum odoratum f.
Bellis perennis l.
Caltha palustris var. *minor* l.
Cardamine pratensis o.
Carex dioica f.
C. nigra ld.
Cerastium vulgatum f.
Cirsium palustre o.
Epilobium palustre o.
Equisetum palustre a.
Festuca rubra a.
Leontodon autumnalis o.
Prunella vulgaris l.
Selaginella selaginoides f.
Trifolium repens a.
Acrocladium cuspidatum l.
Aulacomnium palustre la.
Bryum pseudo triquetrum ld.
Climacium dendroides l.
Cratoneuron commutatum d.
C. filicinum l.
Dicranum bonjeani o.
Mnium punctatum ld.
Philonotis calcarea la.
P. fontana f.
Chiloscyphus sp. o.
Leiocolea bantriensis l.
Pellia cf. *fabbroniana* o.
Riccardia pinguis o.

This habitat corresponds very closely to those in which *Saxifraga hirculus* occurs on the Crossfell / Mickle Fell range farther north in the Pennines. From the frequency of flower buds, it appeared that the Shunner Fell colony was going to flower well and early in 1967.

D. A. Ratcliffe

SPRING FORAY AT PICKERING

W. G. Bramley

The Spring Foray of 1967 was a joint meeting of our committee with the British Mycological Society. Judging from hind knowledge the week-end 19th–22nd May was the best in the month, and some forty members and friends enjoyed the fungi and countryside. To older members of the Yorkshire Committee it was very pleasing to see once again Miss E. M. Wakefield and Mr. and Mrs. Graddon.

An inauspicious start was made in rain on Friday to Castle Howard. Fortunately the weather cleared by mid-day, though it continued overcast and dull.

Duncombe Park on Saturday was much sunnier and drier underfoot, though a 'lamb storm' made some of the party take shelter in an old Nissen hut in which a rabbit hunt ensued providing an hilarious break from more serious study. Many of the old beeches are the host for *Fomes fomentarius*, some of which are many years old.

On Sunday the party split into small groups and many areas of the district were visited. Sunday also saw the party diminish in numbers as duty called members back to work the following day.

Sleightholmdale near Kirkby Moorside was visited by most of the remaining members on Monday, which was another fine day and quite a different type of scenery was enjoyed. The Yorkshire chairman also found more water than he appreciated when he slipped into the stream within a yard of safety.

Thanks are due to the Castle Howard and Feversham estates for permission to visit their estates. A few of us were also indebted to Mr. G. Simpson, Wilf Life Officer to the Forestry Commission, for a moonlight trip to Allerston Forest to see the large discomycete *Sarcosphaera eximia*. A week or two later Mr. Simpson counted over 120 of these large fungi in the area.

A detailed list of the fungi found will be published in the Bulletin of the British Mycological Society in the coming year. A general account should also be in the forthcoming autumn number of the Bulletin. A number of copies of the list will be reserved for Yorkshire members who should apply to the Recorder.

BRYOLOGICAL MEETING, BIRK GILL, COLSTERDALE, V.C.65

15th April, 1967

F. E. BRANSON

The choice of Birk Gill in Colsterdale for the Spring Bryological Meeting was a fortunate one, and the weather was very favourable. There was a luxuriant display of bryophytes all along the valley and especially about half a mile along on the Swinton side where the gill narrowed and there were very wet dripping shale cliffs bounding the gill, draped in intricate tapestries of bryophytes, most beautiful and interesting. Colsterdale is six miles due west of Masham and lies on the carboniferous system of millstone grit. The tall cliffs are of shale, but there must have been a trace of limestone to account for the presence of the fern *Asplenium viride* and small quantities of the moss *Ctenidium molluscum* and other calcicolous species. We collected for about a mile along the stream, but can only have noted a fraction of the species which were present in this jig-saw puzzle. Three new V.C. records were made, viz.:

Pellia neesiana found by Mr. Shaw and myself on a ledge of the cliffs, both male and female plants present.

Blindia acuta var. *arenacea* I collected in abundance from several ledges on the cliffs. This variety has an extremely long subula to the leaf and is quite rare.

Plagiothecium curvifolium, found by Miss Dalby on a tree trunk.

Dicranum fuscescens was dominant on boulders at the beginning of the valley, and *Hyocomium flagellare* was plentiful on rocks in the gill. On a rock ledge was some magnificent *Fissidens adianthoides*, 4.5 inches tall, which exceeds the measurement (4 ins.) given in Dixon's *Handbook*. The luxuriance of the bryophytes was not surprising on account of the wetness of the cliffs. Hanging from these was a beautiful tapestry of the hepatic *Trichocolea tomentella* and also of *Scapania undulata* (the form previously known as *S. dentata*), making walls of a brownish-purple colour. Two other forms of *S. undulata* were also seen, viz.: the original plant on rocks in the gill and the smaller *Scapania intermedia*. Growing on the concrete sides of a conduit were both *Orthotrichum anomalum* and *O. cupulatum*, with abundant capsules and therefore determinable. The identification of the Orthotricha depends on the form of stomata in the walls of the theca, the surface of the calyptra and other characters only seen in fruiting material. Other interesting hepatics seen were *Riccardia pinguis* (excellent male plants), *Blasia pusilla*, *Chiloscyphus pallescens*, *Plectocolea obovata*, *Solenostoma sphaerocarpum* (on rocks in the gill, fruiting), *Cephalozia media*, *Nowellia curvifolia* and *Plagiochila asplenioides* var. *asplenioides* (surprisingly only in one place. It is usually abundant in such habitats). I collected the hepatic *Calypogeia muelleriana* and the moss *Hylocomium brevirostre*, both second records for the vice-county.

Other interesting mosses were *Hookeria lucens*, *Isothecium myosuroides*, *Seligeria recurvata*, *Philonotis fontana* (mostly fruiting material, all along the cliffs), *Hygrohypnum ochraceum* (I had this from a rock in the stream). Mr. Shaw gathered both *Dicranella subulata* and *D. rufescens*.

My thanks are due to Mrs. J. A. Paton, Mrs. J. Appleyard, R. D. Fitzgerald, J. H. Field and A. C. Crundwell for looking at various items. Nomenclature and arrangement follow 'Census Catalogue of British Hepatics' (4th edition) by J. A. Paton for Hepatics, and 'Census Catalogue of British Mosses' (3rd edition) by E. F. Warburg for Mosses. Miss Dalby has contributed the following report on the Sphagna.

SPHAGNA (M. Dalby)

The distribution of the species in Birk Gill was interesting. Growing among rushes in the swampy areas and bogs on the floor of the valley *S. recurvum* was dominant with *S. fimbriatum* and *S. teres* also present and *S. palustre* in the drier areas and in tussocks along the edge of the stream. Further up the gill where the valley narrows, *S. girgensohnii* was abundant, hanging in great cushions above the wet rocks on the steep right hand bank. *S. quinquefarium* and *S. robustum* were both found on this bank and a little *S. rubellum*, while higher up the slope tight packed tussocks of *S. capillaceum* were frequent. The lower left hand bank was less productive as the trees came down nearly to the stream, and the sphagna were confined to wet flushes, but there was a lush patch of *S. squarrosum* in one. *S. subsecundum* var. *auriculatum* was found in all parts, in its green form in the lower part of the valley but a striking orange where it trailed over the wet rocks of the gorge, and *S. plumulosum* was also abundant.

My thanks are due to Miss Lobley for confirmation of some of the species.

Species of liverworts and mosses recorded, but not mentioned above, are as follows:

HEPATICAE: Thalloid
Conocephalum conicum
Marchantia polymorpha
Riccardia multifida
Pellia epiphylla

Foliose
Lepidozia reptans
Calypogeia fissa
Lophozia ventricosa
Barbilophozia floerkei
B. attenuata
Solenostoma triste
Marsupella emarginata
Lophocolea bidentata
L. cuspidata
Cephalozia bicuspidata
Diplophyllum albicans

MUSCI: Acrocarpi
Atrichum undulatum
Polytrichum aloides
P. urnigerum
P. juniperinum
P. formosum
P. commune
Fissidens bryoides
F. taxifolius
Ceratodon purpureus var. *purpureus*
Blindia acuta
Dichodontium pellucidum c.fr.
Dicranella palustre
D. heteromalla
Dicranoweisia cirrata
Dicranum majus
D. scoparium
Campylopus pyriformis
C. flexuosus
Leucobryum glaucum
Encalypta streptocarpa
Barbula convoluta
B. cylindrica
B. recurvirostra
Gymnostomum aeruginosum c.fr.
Grimmia apocarpa c.fr.
G. pulvinata c.fr.
Rhacomitrium aciculare
Tetraphis pellucida
Orthodontium lineare
Pohlia nutans
P. wahlenbergii
Bryum pallens
B. pseudotriquetrum
B. argenteum
B. capillare
Mnium hornum
M. stellare
M. undulatum
M. punctatum
Aulacomnium palustre
Philonotis fontana var. *adpressa*
P. calcarea

Pleurocarpi
Fontinalis squamosa
Thuidium tamariscinum
Cratoneuron commutatum var. *commutatum c.fr.*
Drepanocladus revolvens var. *intermedius*
Drepanocladus uncinatus
Acrocladium cuspidatum
Brachythecium rutabulum
B. rivulare
Eurhynchium striatum
E. praelongum
E. riparioides
Pseudoscleropodium purum
Pleurozium schreberi
Isopterygium elegans
Plagiothecium succulentum
P. undulatum
Hypnum cupressiforme
Rhytidiadelphus squarrosus
R. loreus

A Guide to the Pennine Way by **Christopher John Wright.** Pp. xx + 252 with 28 maps and 85 photographic illustrations. Constable. 25/–.

Every north countryman who loves the moors and open hills, if only occasionally crossing them on foot, will welcome this book. To the enthusiastic walker who contemplates doing either all or part of the 250 mile journey along the Pennine Way it will be quite invaluable both as a guide to the route and for the information which it contains about the places visited, the distances involved, the accommodation available and the features of natural beauty and historic interest visible, or accessible, from the route covered. The numerous maps — reproduced from the 1-inch O.S. maps — covering all sections of the journey, and the generous supply of full page photographs of places and scenery, add greatly to the value of this very practical and informative book. It slips easily into the pocket and should be an essential part of the equipment of every walker along the route since in addition to serving as a reliable guide it will add substantially to his or her pleasure. W.A.S.

BOOK REVIEWS

Commons and Village Greens by **D. R. Denman, R. A. Roberts** and **H. J. F. Smith.** Pp. 512 including IV appendices, a glossary and an index, also 36 black and white photographs and 20 maps. Leonard Hill. 1967. 7 gns.

This comprehensive book is 'a study in land use, conservation and management based on a national survey of commons in England and Wales 1961–1966, financed by the Nuffield Foundation'.

In order to understand why this study was undertaken it is necessary to know that from 1955 to 1958 a Royal Commission sat under the chairmanship of the late Sir Ivor Jennings, to consider evidence on the condition of common land, village greens, and similar places in England and Wales and that it published a report on its findings and recommendations on the 18th July, 1958. The recommendations followed two main courses; the registration of the ownership of common land and common rights; and the inauguration of statutory management committees to look after commons and to be responsible for promoting and administering approved management schemes. A decisive step towards the carrying out of the recommendations of the Royal Commission was the Commons Registration Act, 1965, which requires the setting up of county registration authorities to receive and register claims to the ownership of common land and common rights. The Act does not, however, make provision for the setting up of statutory management committees, nor for the promotion of approved management schemes. These logical steps will doubtless be taken in due course and this book has been prepared in anticipation of this event.

The research team and the joint authors of this book were assisted by an advisory committee of experts under the chairmanship of Col. C. M. Floyd. Three surveys were undertaken; the first to find out the range of diversity in the type of commons, the second to study in detail the physical, proprietary, social and economic features of selected commons and their immediate surroundings and the third to investigate special areas where management problems were exceptionally complicated. In all some 536 commons were studied with examples from almost every county in England and Wales, including Greater London.

The owner of common land may be the Lord of the Manor, a private individual, a District Council or the National Trust and its special character lies in the fact that in the distant past certain rights of free access, common pasturage, heather and turf cutting, etc., were conferred on certain commoners and that although these rights may not have been exercised for a long period they may still exist. In this book the commons for management purposes are classified into twenty-one groups and it is stated that together they add up to more than one and a half million acres of land. It is possible to purchase a common from the owner and then, after compensating those commoners with vested interests, to secure the freehold, and this was done in the plain of York in the case of both Strensall and Allerthorpe commons, the first by the War Dept. and the second by the Forestry Commission.

The 21 groups into which the commons are divided are each considered in detail and their physical characteristics, present condition, common rights and land use are examined and management policies suitable for each group suggested. As this work proceeded it became clear that in certain parts of the country the commons, although separate entities, formed unique groups which could with advantage come under a single management scheme. These groups, situated in the Lake District, the Gower Peninsula, on Dartmoor and elsewhere, are dealt with separately and it is in this connection that the 20 maps have been included.

Under codes of practice, public access and car parking receive attention, especially as on many commons, on which grazing rights exist, there are neither fences nor cattle grids, with the result that livestock suffer and that commons that would greatly benefit from grazing have been abandoned. If management committees are to function satisfactorily, finance is essential and a number of ways of raising funds such as tolls, public rates, voluntary contributions, and the use of land resources are considered. In some cases selling, leasing and exchanging common land might be advantageous. Such possibilities as leases to the Forestry Commission and rents from golf courses and playing fields are also considered. Throughout the book it is stressed that wherever common rights exist and whatever their nature, the commoners must either freely enter into such management schemes, because they benefit thereby, or receive just compensation if these rights come to and end.

Legal and other assumptions are examined in a special chapter, following which are some interesting statistics relating to the 439 commons of the original survey. For instance one in two of the commons surveyed suffer from severe or partial neglect and this is as prevalent where the commoners are known (26½%) as it is where they are unknown (24%).

A chapter is devoted to the work entailed in making a preparatory survey and in the appendices examples are given of the comprehensive questionnaires which were used. The glossary is useful as many of the terms used are rarely heard today and finally the 526 commons are listed to which reference is made in the text. Of these 23 are in Yorkshire, three in the East, eight in the North and twelve in the West Ridings. The authors are well aware of the activities of the Nature Conservancy, the County Trusts and other organisations interested in Nature conservation and the need to safeguard special sites.

This book deals with the commons of England and Wales in great detail: it will be invaluable to those responsible for taking the next logical step and setting up management committees empowered to make the best possible use of this great area of somewhat neglected common land. It is perhaps unlikely that many readers of this review will decide to purchase copies, especially as their interests are likely to be mainly directed to a single county, but certainly copies should be made readily available in reference libraries throughout England and Wales. E.W.T.

Land and People. A summary of seven papers delivered at the Cambridge University Summer Conference on this theme. Pp. 100, with a short preface by Lord Howick of Glendale. Leonard Hill. 1967. 35/-.

The seven independent essays that comprise this book are all written by experts but issues of some complexity arise and the reader must not expect to be led to simple and final conclusions. Powers that once were vested in the owners of estates are being more and more taken over by the State and this trend is likely to continue. Such decisions must often now be made by a department of Government in the interests of the people. How are these interests determined and how does one define the 'public good'? Such decisions will generally relate to conservation, forestry, agriculture, recreation and planning generally.

All the articles are interesting and instructive and Chapter 5 by Professor E. W. Hofstee of Wageningen outlines the extent to which the powers of the Dutch landowners have already been taken over by the State; perhaps a pointer which may be followed by other European countries. A pertinent paragraph in Lord Howick's preface reads:

'I feel that in all this a race is going on. One runner is the increasing demands on the countryside of housing and economic development joined with the rising claims of recreation. The other runner is an increasing awareness among many people and notably among viewers of nature programmes on television, of the need to take active measures to conserve wildlife and the conditions in which that wildlife can continue to exist.'

This book is for the specialist rather than the general reader, though the issues involved must ultimately affect us all. The volume is well written and produced but the price appears high. E.W.T.

Lakeland Molluscs. Pp. 74 with 3 full page illustrations. Published by the Carlisle Natural History Society and obtainable from E. Blezard, 100 Durdar Road, Blackwell, Carlisle. 10/6 post free.

This carefully compiled handbook is shared between Marjory Garnett and Mary M. Milne with their preliminary list of the marine mollusca of Lakeland, and Ernest Blezard's list of non-marine mollusca of the same region, supplemented with details of crop, stomach, and pellet contents of thirty species of British birds, stressing the presence of molluscs as food in many instances. The authors of the marine list are mainly beach-combers of dead shells and visitors on holiday, collecting stranded shells, will find the text, English names and photographs helpful. There are ten pages of distribution tables localising each species. The non-marine list is also incomplete and slugs have been neglected. It is however, a useful publication. J.A.

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THE NATURALIST

A Quarterly Journal

Principally for the North of England

Edited by
W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
with the assistance as referees in special departments of

R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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THE YORKSHIRE NATURALISTS' UNION

ORNITHOLOGICAL SECTION

A. From 1st January, 1968, the Hon. Secretary of the Ornithological Section will be:

M. DENSLEY,
50 Carr Manor View,
Leeds 17.

B. Will any members, particularly those living on or near the coast, who visit any sea-bird colonies and who are willing to assist with 'A Survey of Attendance of Sea-birds at their Colonies', please write for the necessary information and forms to J. J. D. Greenwood, Dept. of Natural History, The University, Dundee.

C. The Ornithological Section has had slips printed on which members can enter their observations of birds. These standardised forms will, it is hoped, ease the work of the recorders and stimulate a more steady flow of records.

Members who wish to acquire a supply for their private use can obtain bundles of 210 for 2/6 from the Report Editor (A. J. Wallis) preferably at the March and October Meetings.

D. Will any members who have collected information about occurrences of oiled birds please send details without delay to the R.S.P.B., The Lodge, Sandy, Beds.

THE NATURALIST

BRITISH
29 JAN 1968
NATURAL HISTORY

FOR 1968

THE NATURALIST, THE UNION AND THE FUTURE

At the end of 1963 the Union changed its printers. For 58 years *The Naturalist* had been printed in Hull. We had been well served by our printers there but the combination of increasing costs and the greater convenience of having editor and printer in the same town dictated the change to our present arrangements. The financial benefits of the change have proved to be short-lived, for printing costs throughout the industry have steadily mounted and the Union is now faced with a second and substantial increase in printing costs since Maney's took over the work.

Adverse balances of payments are so much in the news at present that most readers will be heartily tired of this depressing subject. But it is a problem which besets us too. The Executive of the Union has contrived so far to manage its affairs — admittedly less complex than those at the national level! — without running into debt and, we hope, without devaluing its service to Yorkshire naturalists. It has also contrived to do so without passing on the spiralling costs to members, for despite the totally changed values of the present as compared with pre-war days, the subscription to the Yorkshire Naturalists' Union has risen by a mere five shillings and that increase was made twenty years ago.

The Union is not a profit-making body and so long as we can pay our way without running into debt or sacrificing our standards in any way, we are satisfied. The Executive has always sought to avoid raising the subscription rate if at all possible and a considerable amount of energy and ingenuity has been expended in recent years by officers of the Union in seeking to circumvent the apparently inevitable. With the four issues of *The Naturalist* already absorbing the whole of each member's subscription our ability to do so any longer however is clearly not possible.

At the last Executive meeting it was decided however that, despite the ominous news of the further increase in printing charges amounting to an additional £140 per annum and the fact that our accounts for the past year show a credit balance of only £29, the subscription rate should **not** be increased for the coming year. A loss seems inevitable. It is certainly beyond our control now. **But it is not beyond yours.**

There are two ways in which members can give substantial help to the Union. Although our membership is higher now than at any time in the history of the Y.N.U., it is still far too low for a Society representing the largest English county. It should be double what it is, and if every member would make a point of introducing one recruit in the course of the year this target could be reached within twelve months.

Members of Affiliated Societies are entitled to attend meetings of the Union and many do so. Because of this entitlement they sometimes decline to become full members of the Union on the grounds that they do not thereby get added benefits proportionate to their subscriptions. May we suggest some rethinking about this? Would it not be more appropriate to substitute for the 'What do I get out of it' attitude a 'How can I support the interests of natural history' approach?

There is a second and very important way in which members can help. We are able to obtain from the Inspector of Taxes an additional sum by way of income tax repayment equal to 70% of your subscription if you sign a Deed of Covenant which commits you to remain a member for seven years. It is still not realised by many members how much they help the Union, without any cost whatever to themselves, if they covenant their subscriptions. Provided you have no more than £1. 15. 0. of income taxed at the highest rate or the equivalent amount of Building Society interest, it will not affect your own income tax or cost you any more if you pay your subscription by deed of covenant. And if you should die before the seven years are up the covenant is automatically cancelled and there is no liability on your estate.

We are grateful to the many members who have already arranged to pay their subscriptions in this way. The sum recovered on these covenanted subscriptions has provided the additional source of revenue which alone has made it possible to meet expenses additional to those connected with *The Naturalist*. If all others who are eligible would do so, no increase in subscription rate need be contemplated. To take so simple a step which will not cost you a penny but which will benefit the Union so much, is surely not an unreasonable request.

CHISLETT MEMORIAL LECTURE

The third Chislett Memorial Lecture was held in the University Lecture Theatre, Hull University, on Saturday, 9th September, 1967, under the chairmanship of Prof. N. F. Robertson.

James Fisher, the well-known broadcaster, author and ornithologist (and a member of the Union since 1947) showed Roger Tory Peterson's film 'Wild America'. With Peterson he had made a journey 'from Newfoundland to Alaska, via Mexico' to visit the many National Parks, Game Reserves, etc., of the North American continent. Peterson's excellent film documentary of their journey was enlivened for the large attendance at this Memorial Lecture, by James Fisher's vivid commentary. Though largely ornithological, the film contained much of interest to botanist and mammologist. Particularly memorable were sequences on the Limpkin (*Aramus guarauna*) on the various species of Alcidae, and on Blue Geese; while the confusion arising from the use of English names was brought home particularly in the case of Herons and Egrets, and Phalaropes.

Mr. Athol Wallis of Scarborough expressed the meeting's appreciation — already made obvious both by its attentiveness and spontaneous applause — to Mr. Fisher. He also thanked Mr. Brian Pashby, secretary of the Hull Scientific and Field Naturalists' Club, who had attended to all local arrangements. Seventeen local societies were represented at the meeting, sixteen answering the roll-call and Beverley who have recently become affiliated to the Union inadvertantly omitted.

The Union is indebted to Mr. and Mrs. D. Cutts of South Cave for entertaining the speaker.

Y.N.U. AND Y.N.T. JOINT SYMPOSIUM

As one of the means of promoting an increased liaison between the Yorkshire Naturalists' Union and the Yorkshire Naturalists' Trust it has been decided to hold a Joint Symposium on 13–15 Sept, 1968. The meeting will be held in York where arrangements have been made for accommodation in one of the University Halls of Residence. The theme of the Symposium will be the "Changing face of Yorkshire'.

Mr. E. Max Nicholson has agreed to attend and address the gathering and other distinguished naturalists have been asked to take part and to speak about their special knowledge of the impact of modern trends in land utilisation, etc., and their bearing on the problems of wild life conservation.

Those attending the full course will assemble at York on the Friday evening when a film will be shown. There will be three talks on the Saturday morning, a visit to a Reserve in the afternoon and a dinner followed by another speaker on the Saturday evening. More short papers will be given on the Sunday morning and after lunch a summing-up of the conference will be given. Discussion time will be allowed after each speaker.

The success of this venture depends upon the support which is given to it by members of both bodies. We hope that many Y.N.U. members will attend the whole Conference and that many more who are unable to do so will come for one or more days. Full details of speakers and charges for accommodation and for separate meals will be advertised later in *The Naturalist*. Meanwhile will members please note the date and will Secretaries of Affiliated Societies please bring the matter to the attention of their members. It is hoped that official representation of each Society will be arranged and that parties will be organised to attend on at least one day during the holding of the Symposium.

Spiders, Snakes and Other Outcasts by **Robert Froman.** Pp. 108, with 10 drawings by Leslie S. Heywood. Bell. 1967. 13/6.

A brisk account of some interesting biological facts concerning a selection of spiders, toads, snakes, cockroaches, bats and a few other animals that produce a feeling of repulsion in most people. An anxiety complex in flatworms, the colour-changes of octopuses, blood temperature control by reptiles, are some of the intriguing topics discussed. A stimulating book for anyone with a developing interest in biology or natural history, and an antidote to the feeling of disgust. J.H.F.

THE YORKSHIRE NATURALISTS' UNION
ONE HUNDRED AND SIXTH ANNUAL REPORT

The Hundred and Fifth Annual Meeting was held on 3rd December, 1966, at Hull, by invitation of the Hull Scientific and Field Naturalists' Club.

The Presidential Address entitled 'A Mycologist's View of Natural History' was delivered by Professor N. F. Robertson, and was subsequently published in *The Naturalist* 1–4, 1967.

The Presidency for 1968 has been offered to and accepted by James Fisher, Esq., M.A.

The Excursions for 1968 will be to:

V.C. 61	Pocklington Canal	20th July
V.C. 62	Hawnby	15th–16th June
V.C. 63	Bretton Park and Stocksmoor	6th July
V.C. 64	Mickley	8th June
V.C. 65	Catterick	25th–27th May

The past year has again been one of continuing progress. Many enquiries have been made about membership and it is pleasing to record that this is now the highest in the Union's long history. Much information about the activities of the Sections as well as the Societies affiliated to the Union has been given in the Newsletters which all members have received.

The Union's Travelling Exhibition has been on view at several centres in Yorkshire including the Harrogate Festival, the British Association Meeting in Leeds and the Barnsley Naturalists' Society's Centenary Year Exhibition. In all cases it has received very favourable comment on the quality of the various panels featuring Yorkshire's wild life.

At the request of the West Riding County Council's Planning Officer the members and affiliated societies have been compiling schedules of sites of scientific interest in their own areas. Already more than 60 such sites have been listed and the inventory of those lying within the administrative area of the West Riding is being closely studied and recommendations made to the Nature Conservancy.

The Union's Executive has given further consideration to the question of closer co-operation between the Union and the Trust. It has not been found possible, however, to publish a joint Newsletter but it is hoped to arrange a joint weekend Conference in 1968.

The third Chislett Memorial Lecture was held at Hull on 9th September, when Mr. James Fisher, the well-known ornithologist, and one of our own members, showed the film 'Wild America' which he made with Roger Tory Peterson.

In common with most societies the Union is having to face rising costs particularly those connected with the charges for printing. The Executive has been considering ways and means of meeting these increases without making any increase in the rates of annual subscription.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 13 Life Members, 564 Ordinary Members, 52 Associates and 43 Affiliated Societies.

Deaths

We record with regret the death of the following members: Miss F. Bradley, Rev. P. M. Garnett, B. Linney, and Mrs. McGrigor Phillips.

Resignations

R. D. Ackerley, J. M. Bayldon, A. Dixon, Mr. and Mrs. H. B. Elenor, J. Govett, G. E. C. Hemingway, D. Holmes, Dr. P. G. Keates, Mrs. E. Lord, J. C. Maycock, J. Miles, Mr. and Mrs. K. Peller, G. Sayers, G. B. Wakefield, H. S. Walker, I. Walker, R. P. Wootton.

New Affiliated Societies

Beverley Natural History Society (Hon. Sec.: Mrs. M. E. Fox, 21 Alpha Avenue, Beverley).

Goole and District Natural History Society (Hon. Sec.: B. Greenacre, 33 High Street, Airmyn, Goole).

Change of Secretary

Craven Naturalists' and Scientific Association (Hon. Sec.: P. M. Wright, Esq., 61 Regent Crescent, Skipton).
Huddersfield Naturalist Photographic and Antiquarian Society (Hon. Sec.: Mr. E. C. J. Swabey, 46 Kennedy Avenue, Fixby, Huddersfield).
Leeds and District Birdwatchers' Club (Hon. Sec.: J. S. Kenyon, Esq., 56 Estcourt Avenue, Leeds 6).
York and District Field Naturalists' Society (Hon. Sec.: Mrs. G. Elliott, 20 Hempland Lane, York).
Harrogate and District Naturalists' Society (Hon. Sec.: Mrs. A. M. Melford, 16 Beckwith Road, Pannal Ash, Harrogate).
Hull Geological Society (Hon. Sec.: Mrs. Joan M. Ward, 21 Elmfield Drive, Cottingham, E. Yorks.).

Change of Address

Arnott, Mrs. J. N., 73 Frenchgate, Richmond, Yorks.
Bell, D. G., 'Rosenmas', 18 Rosedale Crescent, Guisborough.
Bennett, G. R., 'Fairweather', Hunt's Hill, Blunsdon, Nr. Swindon, Wilts.
Blakeway, J. E., Oak Busks, Back Lane, Alne, York.
Clarke, R. O. S., 78c Granville Road, Sevenoaks, Kent.
Collins, J., Litton Mills Field Studies Centre, Litton Mills, Buxton, Derbyshire.
Cutts, D. B., 81 Beverley Road, South Cave, Nr. Brough.
Fisher, J., Ashton Manor, Northampton.
Grainger, Miss J., Oaklands, Turnshaw Road, Kirkburton, Huddersfield.
Harnett, Mrs. V. M., 361 Spen Lane, Leeds 16.
Harris, R., 16 Main Street, Barwick-in-Elmet, Leeds.
Heald, H., Cleveland, 2 St. John's Road, Loughton, Essex.
Jackson, E. E., The Wildfowl Trust, Slimbridge, Glos.
Lush, R. L. G., 32 Matthews Green Road, Wokingham, Berks.
Martin, S., 'Garlies', The Park, Swanland, N. Ferriby, E. Yorks.
Medd, Mr. and Mrs. T. F., 53 Bootham Crescent, York.
Rider, A. H., The Infirmary, Workington, Cumberland.
Rutherford, C. I., Longridge, Macclesfield Road, Alderley Edge, Cheshire.
Sanderson, Miss M. R., 51 Lancaster Park Road, Harrogate.
Simpson, G., 37 Whitfield Avenue, Pickering.
Speake, B., Greenhow, West Rounton, Northallerton.
Spalding, D. A. E., Provincial Museum and Archives of Alberta, Edmonton, Alberta, Canada.
Stembridge, H. L., Hall Farm, Crakehall, Nr. Bedale.
Walker, J. E. S., 27 Westgate, Hornsea.

New Members

Appleby, R. H., 38 Tennyson Avenue, Scarborough (O).
Blundell, Miss Margaret, 158 Otley Road, Leeds 16 (B.Br.M.).
Bower, Mrs. M., 17 Woodlands Rise, Silkstone Common, nr. Barnsley (A).
Broadhead, E., M.A., B.SC., D.PHIL., F.R.E.S., Zoology Dept., The University, Leeds 2 (E).
Burn, Mr. and Mrs. D. M., 6 Dargai Street, Leeds 7 (E.Z.).
Clarke, H., 129 Morthen Road, Wickersley, Rotherham (B).
Darwood, H. A., 3 Avenue Terrace, Clifton, York (B).
Dix, Mrs. A. M., B.SC., 25 Kennedy Avenue, Fixby, Huddersfield (Z).
Ellam, J. D., 349 North Road, Anlaby Road, Hull (O.Z.).
Ellerby, C., 52 Bondgate, Helmsley (O).
Elsworthy, G. C., 47 Ogden House, Danecourt Road, Holme Wood, Bradford 4 (O).
Field, J. H., B.SC., 34 Wells Green Road, Sheldon, Solihull, Warwickshire (Br.).
Fields, Miss Lynda C., Outwood, Treeton Lane, Aughton, Sheffield (O.Z.).
Fitzgerald, Miss Jean, Dale Hall, Elmwood Road, Liverpool 18.
Flint, P. W. H., 7 Norfolk Terrace, Leeds 7 (E).
Gilleghan, J. A., B.SC., M.I.BIOL., 383 Selby Road, Whitkirk, Leeds 15 (B).
Greenhalgh, M. E., St. Mary's Vicarage, Brockholes View, Preston.
Handley, J. F., 30 Lee Green, Mirfield (O).
Hartley, C., 26 Hazel Crescent, Chickenley, Nr. Dewsbury (B).
Hartley, Miss M. M., B.SC., The Yorkshire Museum, York (Br.).

Herringshaw, D., 64 Butterthwaite Road, Sheffield 5 (B.E.O.).
Huddlestone, Miss F., Kildare Bungalow, Baghill Lane, Pontefract (M.Z.).
Kemsley, Mr. and Mrs. J., 36 Partridge Flatt Road, Bessacarr, Doncaster.
Land, A. E., 23A High Street West, Uppingham, Rutland (G.O.).
Marjoram, Mrs. D., B.SC., 106 Bolling Road, Ben Rhydding, Ilkley.
Metcalfe, R. J. A., M.A., Trinity and All Saints Colleges, Horsforth, Nr. Leeds.
Miller, Miss Joan B., 9 Wheatley Lane, Ben Rhydding, Ilkley (B).
Norris, A., City Museum, Municipal Buildings, Leeds 1 (C).
Oldfield, P., B.A., 10 Danebury Drive, Acomb, York (E.Z.).
O'Shea, B. J., 44 Lee Park, Blackheath, London S.E.3 (Br.).
Paget, R. J., B.SC., M.B., CH.B., 13 The Baulk, Worksop, Notts. (B.Z.).
Palmer, M. J., 5 Magbridge, Honley, Huddersfield (O).
Roberts, Mr. and Mrs., 9 North Park Road, Bradford 9.
Simpson, C., 17 Sutherland Grove, Norton, Stockton-on-Tees.
Spray, M., Wills Hall, Stoke Bishop, Bristol 9.
Sutton, S. L., B.A., D.PHIL., Zoology Dept., The University, Leeds 2.
Swabey, E. C. J., 46 Kennedy Avenue, Fixby, Huddersfield.
Thurston, Miss H. M., 112 Simonside Terrace, Heaton, Newcastle upon Tyne 6.
Upton, T. W., 'Sternes', Westwood, Beverley (O).
Vernon, Miss N. G., 22 Parish Ghyll Road, Ilkley (B).
Winter, P. Q., West House Farm, Muston, Filey (E.O.).

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

T. M. CLEGG

1967 has seen an increase in the number of people submitting records for inclusion in this report, but the coverage of the county as a whole remains patchy. In particular the north-west and part of the West Riding would benefit from increased activity amongst our members. The East Riding, the Scarborough district and the area around York have given rise to the greatest number of records and these have been channelled to me by Society recorders. The volume of fish records received from the Scarborough area is the greatest since W. J. Clarke collected records in the area and is largely the work of C. I. Massey, who has sent records for this and past years. Very few records of reptiles and amphibians have been received and in these groups there is concern about the status of various species nationally, so all records will be appreciated during the following year. Because records may not actually appear in this report it should not be thought that they are unimportant — all are filed and add to the body of information on the fauna of the county. It is gratifying to see that so many animals which are found dead or killed, accidentally or deliberately, are passed on to museums. Records which are backed by a specimen and from which full data is extracted during the preparation of this material are especially important in this day and age. Whilst not advocating deliberate collecting to an excessive degree, I can assure anyone who is in a position to pass this sort of material on to a museum that it is appreciated.

MAMMALIA

INSECTIVORA

Hedgehog: Road mortality reports from the Scarborough area give peaks in April–May and August–September, the only winter death being one at Rillington on 23rd December, 1966. A 300 yard stretch of road at East Ayton had 10 dead hedgehogs between April and August (C.I.M.) A *Scarborough Evening News* report told of up to 25 individuals being present in a garden in the town on one evening in August. Reports from elsewhere indicate status normal, but close study of road mortality is desirable.

Pigmy Shrew: Records from the following localities: near Allerthorpe Common (Miss V. Maltby), Wilton Park, Batley (T.M.C.), and the following localities near Scarborough; Muston, Cayton, Hutton Buscel, Raincliffe Woods and Newby (C.I.M.). A female at Newby, killed by a cat on 11th September, contained four full term embryos.

Water Shrew: Records from River Greta (Y.N.U. Excursion rep., C.S.), Central Vale of York, Pickering, Thirsk, Scugdale and Oswaldkirk (C.S.), Muston, Scalby, Hackness, Hay Bridge, Hutton Buscel, Stoupe Beck and Langdale End (C.I.M.). Good numbers were referred to in a report from Kelleythorpe (Mr. Upton per Mrs. G. de B.).

Mole: High mortality in the Vale of Pickering during the first week of July — suggested causes, worms burrowing too low for moles to follow or hard ground forcing moles to hunt on the surface (C.I.M.). A pinky-white individual was trapped near Pickering in May. A dead female at Hunmanby on 27th April contained four embryos, eight mm. long (C.I.M.). A report from the York area that the species has been very inconspicuous this year seems rather against the trend of other reports (C.S.).

CHIROPTERA

Daubenton's Bat: One, mist netted at Wath Ings on 28th August, was kept for a few days and then released (H. E. Beaumont).

Long-eared Bat: Reported only from Bretton Park (M.B.).

Pipistrelle: Records from Beverley, Bretton Park and Scarborough, where activity was noted on 10th January, 1967. The Bretton example was sharing a tree-hole roost with Noctules.

Noctule: Three, at roost in tree-hole, Bretton Park in May (M.B.). A large bat, probably of this species, was seen flying high amongst Swifts at Beverley on 31st July.

LAGOMORPHA

Blue Hare: Two were seen in the usual area above the Yorkshire-Derbyshire border in April (C. Jukes). A Dewsbury poulterer had the Scotch and Irish forms of this species on sale during the year.

Brown Hare: Very few records; mentioned as frequent near Whitby (A. G. Walker) and were given the same status at Salendine Nook, Huddersfield (A. Norcliffe). At Batley, this species is uncommon, probably due to shooting pressure (T.M.C.). Widespread in the Scarborough area (A.J.W.).

Rabbit: Occasional (A.B.W.) and rare (A.N.) in the summaries of the two observers mentioned previously. Increasing rapidly in the areas round Scarborough and also apparently increasing in many parts of the East Riding, though myxomatosis still present at Cliffe. Over a hundred were reported in a field at South Cave and over 50 near Huggate (B. S. Pashby); there is also a small colony in the grounds of Hull University. At Batley too it is mainly a Park and garden species — with some apparently living under the museum.

RODENTIA

Red Squirrel: Reported from Newmillerdam (J. Boothman) and Bretton Park and two spent the winter in the grounds of Huddersfield museum. It would appear that the south-western part of the West Riding is still one of the few strongholds of this species. In the East Riding the species continues to be reported from the Wassand Hall Estate and one was reported on the Y.N.U. excursion to Barningham.

Grey Squirrel: Not apparently gaining ground much at present, though odd individuals have occurred in Peasholm Glen, Scarborough and two were seen in Bretton Park.

Water Vole: The type and condition of inhabited streams do not appear to matter much to this species. Common in the Batley area on streams heavily charged with pollution, and equally abundant on the River Hertford and parts of the River Derwent as well as in the East Riding carrs.

CARNIVORA

Fox: Eight were shot on an organised shoot at Flamborough in February. Apparently common and well distributed in the East Riding. In Batley the species occupies any available marginal land and the town's Parks. During the summer one was killed on the roof of a farm house within the town boundary.

Badger: Two young from a sett at Cawthorne were killed by cars (J. Seago per R.S.A.). Other traffic victims were an adult male near the North Bay bathing pool, Scarborough, a female near Silpho village, a female near Wentbridge and another on the nearby A1. At least twelve individuals are claimed to be present in the West Bretton area, where one pair had three cubs (M.B.). An adult and three cubs were seen at Deepdale, Beverley, and two cubs were reported from the Scarborough town sett. A flourishing sett is reported at Skirlaugh (G. de B.). On 25th July a badger was found in a snare at Lowdales, Hackness, by C.I.M. I quote from his notes on this, 'The snare was chained to a tree and had bitten deep into the chest of the animal. The wound was a mass of flies and the badger had probably been there three to four days'. A further incident in the chronicle of barbarity against this species.

Following a reference to Badger gassing in a recent Y.N.U. Newsletter, Mr. S. P. Clark has sent me the following statement regarding the Ministry of Agriculture's attitude towards Badger control.

'The matter of the responsibility of officers of the Ministry of Agriculture, Fishes and Food, for gassing Badgers, has been raised in the past, and I can only regret the recent positive inference in this respect in No. 3 Newsletter. The Ministry's attitude in this matter is quite clear. The Badger is not regarded as a significant pest of agriculture and, in fact, may often be beneficial both to agriculture and forestry. In the uncommon event of a "rogue" badger attacking poultry, shooting by a competent marksman of the animal concerned is the recommended method of control. Gassing is illegal.

'These views have been clearly stated to the Federation of Rabbit Clearance Societies which has reproduced them for the benefit of Societies' warreners. These warreners are not Ministry employees. As a member both of that Ministry's staff and the Yorkshire Naturalists' Union, I have again had enquiries made and been assured that no Ministry officer is responsible for this practice; if any Union member has evidence to the contrary an official enquiry will be made.'

American Mink: Escapes of this species continue as does the Ministry of Agriculture's anti-mink campaign. New localities this year include Dunkeswick, near Harewood and Tickton near Beverley and also on the Ouse-Wharfe junction at Selby.

Polecat-ferret: One was killed in Bretton Park on 26th June. The increase in records of this form of the ferret, often virtually indistinguishable externally from the wild polecat, continues.

Otter: Bred in V.C. 62 in the Central Vale district, (C.S.) and also on Humberside to the west of Hull (G. de B.). A national survey of this species is about to commence and any records will be appreciated in the coming year. In view of the continuation of Otter hunting precise localities will only be given to *bona fide* enquirers.

PINNIPEDIA

Grey Seal: One frequented Scarborough harbour during January, 1967 and two young animals were taken to Flamingo Park Zoo from this area during December. The practise of carting young marine mammals off to zoos may influence any future colonisation of the county.

ARTIODACTYLA

Fallow Deer: About 32 are present in the Bretton-Cawthorne area (M.B.). A pair and one young were seen in Weldrake Woods in September (Mr. Blanchard per G. de B.), and the presence of the herd on Skipwith Common was further confirmed by a specimen which went to the Yorkshire Museum.

Red Deer: One was seen on 24th August at Hardcastle Crags, Hebden Bridge by C. Gordon Booth. This would appear to be the first record of this species in the Halifax District.

Roe Deer: Reports received early in 1967 confirm the high population in the Allerston Forest area and there have been further reports from Silpho. One was seen on Skipwith Common in March (B.S.P.). *Caution.* There have been no reports for two years of Sika Deer, though these were seen in some numbers in the west of the county and it is a species which is widely kept in semi-captivity. Observers should take this species into account when making identifications.

CETACEA

(Pilot Whale): A single whale, believed to have been of this species, was seen off the Marine Drive Scarborough, in August (T.M.C.).

Porpoise: A male, four feet long, was captured in the River Idle on 24th May (P. Skidmore). This must have passed through part of Yorkshire at least to arrive so far inland.

REPTILIA

Slow Worm: One was found at Airedale, Castleford, in late September, possibly an escape (R. F. Dickens). Reported in the north-east from High Yedmandale, 30th March, Low Yedmandale and Broxa (C.I.M.).

Common Lizard: Reported from Barningham, Wycliffe, Ellerburn Bank Nature Reserve, Fen Bog, Fylingthorpe Moor and in the York area. Apparently had a good year.

Grass Snake: Reported from the Doncaster area, Selby, Hull, Boroughbridge, Ripon and York — with the possibility of some of these being escapes.

Diced Snake (*Natrix tessellata*): This species has figured widely as an escape or an accidental import and may conceivably become established in the future. Records from Hull (2), elsewhere in the East Riding (2), York (1), Vale of Pickering (1), (C.S.), and from Doncaster (1) (A. H. White).

Adder: A good year for Strensall Common where the species is reported as present on the Y.N.T. Reserve (C.S.). Also reported from Dalby Bog, Harwood Dale, Langdale Moor, Goathland and on the cliffs near Cloughton (C.I.M.).

AMPHIBIA

Crested Newt: There has been an apparent decline in the York area over the period 1965–7 (C.S.). Reported from the Scarborough area at Seamer Gravel Pits, Raincliffe Manor, Cayton Bay and Muston — common in all localities (C.I.M.). Also present in Bretton Park (M.B.).

Palmate Newt: A male was found in a pond at Raincliffe Manor in April and appears to be the first record for this area for a number of years. An unconfirmed report has been received from Stainborough near Barnsley.

Common Frog: This species in common with the other amphibians is the subject of a national enquiry at present, but very few reports have been received. In the Batley area members of Batley Museum Society found frogs in all suitable localities and there were great rafts of spawn in the Needless Dam, near Morley, though this dried out completely by mid-summer.

Common Toad: The Scarborough area was well covered, but again records have been comparatively few generally. During the spring A. J. Wallis made a census of toads dead on the road at Throxenby Mere, clearing up the previous night's kill each time and the following figures resulted from his observations In all a total of 265 toads were killed during the period covered.

No.	*Date*	*No.*	*Date*	*No.*	*Date*
1	30/3/67	23	16/4/67	2	28/4/67
5	4/4/67	57	18/4/67	0	29/4/67
36	5/4/67	2	19/4/67	4	30/4/67
1	7/4/67	23	20/4/67	0	1/5/67
6	9/4/67	4	22/4/67	0	2/5/67
0	11/4/67	14	23/4/67	0	3/5/67
2	12/4/67	30	25/4/67	3	5/5/67
5	14/4/67	0	26/4/67	40	6/5/67
7	15/4/67	0	27/4/67	0	7/5/67

None seen after 7/5/67

Midwife Toad: The York colony persists but does not appear to spread (C.S.).

PISCES

Lampern (*Lampetra fluviatilis*): Reported from the River Ouse in May (C.S.).

Brook Lamprey (*Lampetra planeri*): Reported from Cod Beck near Thirsk in October (C.S.). Several were found in the River Derwent at Langdale End in May (C.I.M.).

Thresher Shark: One reported near entrance of Whitby Harbour on 14th September, said to be 14 feet long. This could have been of the same species, if not the same individual, as a shark seen off Saltburn on 28th August, 1967 (C.I.M.).

Salmon: Several taken from the Ouse this year, suggesting a better run than usual (C.S.).

Trout: A specimen of ten pounds six ounces was taken from the River Rye in July.

Rudd: Live specimens caught at Bentley Cuttings, near Doncaster, were received by Doncaster Museum in October (P. Skidmore).

Dace: Presence in the River Ouse at York confirmed (C.S.).

Stone Loach: Common in Pickering Beck at the head of Newtondale (C.I.M.). Found in River Fosse (C.S.).

Flying Fish: One, found amongst Herrings on the fish pier at Hull, in early October. It was believed to have been caught by a Scottish drifter fishing off the Yorkshire coast. This specimen, the first record since 1894, is now in the Scarborough Museum collection (C.I.M.).

Deal Fish: One, washed ashore in North Bay, Scarborough, on 24th August, 1967, length 6 ft. 6 in. minus tail. A previous record for 6th June, 1964 at Filey, does not appear to have been previously reported (C.I.M.).

John Dory: Two caught off Scarborough in June were both exhibited in the Tunny Club hut (C.I.M.).

Boar Fish: One was found on the fish pier at Scarborough during late August. The specimen unfortunately disappeared — believed eaten by Herring Gulls (C.I.M.).

Ray's Bream: One caught off Scarborough on 27th September, one or two other records towards the end of the year (C.I.M.).

Red Mullet: One caught off Scarborough 11th June, exhibited in Tunny Club hut (C.I.M.).

Red Gurnard: One seen on Scarborough fish pier on 19th August (C.I.M.).

Sapphirine Gurnard: One caught by local keel boat off Filey Bay on 25th May (C.I.M.).

Halibut: A specimen weighing 201 pounds was caught a few miles off Whitby on 19th June: this is five pounds heavier than the largest recorded by W. J. Clarke (C.I.M.).

Connemara Sucker: Recorded from Cayton Bay and Cloughton Wyke in March, 1953 by Hull University zoologists.

Two-spotted Sucker: Recorded from Robin Hood's Bay, Cayton Bay, Whitby, Scalby Ness and Burniston Bay in March, 1950 by Hull University zoologists.

Observations were received on the following species, but these on the whole confirmed previous reports and did not establish new localities or changes in status.

Mammals

Common Shrew
Bank Vole
Short-tailed Vole
Wood Mouse
Brown Rat
House Mouse
Stoat
Weasel
Porpoise

Amphibians

Smooth Newt

Fishes

Tope
Piked Dog Fish
Herring
Pike
Carp
Gudgeon
Minnow
Chub
Roach
Bream
Eel
Garfish
Hake
Cod
Haddock
Bib
Whiting
Coalfish
Lesser Fork-beard
Perch
Ruffe
Lesser Sand Eel
Lesser Weever
Mackerel
Montagu's Blenny
Butterfish
Grey Gurnard
Miller's Thumb
Lumpsucker
Three-spined Stickleback
Ten-spined Stickleback

List of contributors — with apologies for any omissions.

R. S. Atkinson
H. E. Beaumont
Mr. Blanchard
Mrs. G. de Boer
Mr. G. de Boer
C. Gordon Booth
M. Brooke
T. M. Clegg
R. F. Dickens

C. Jukes
Miss V. Maltby
C. I. Massey
A. Norcliffe
B. S. Pashby
Mrs. G. Pashby
C. Simms
P. Skidmore
Mr. Upton
A. B. Walker
A. J. Wallis
A. H. White

ORNITHOLOGY

(R. F. Dickens): Full meetings of the Section were held in Leeds University on the third Saturdays in March and October, in conjunction with the Fishes, Amphibians, Reptiles and Mammals Section. At each of these meetings A. J. Wallis and J. K. Fenton summarised the ornithological records for the intervening six months for the county and for Spurn Bird Observatory respectively. Four new species for the county had been recorded, Greater Black-headed Gull, Blue-winged Teal, Thrush Nightingale and Baird's Sandpiper. Mr. Wallis emphasised the need for restraint on the part of people wishing to see rarities; for observing a code of conduct which both respected private property and the interests of local naturalists. It had been a remarkable autumn for terns and skuas. At Spurn, Golden Oriole, Red-rumped Swallow, Crane and Alpine Swift had been seen; while in autumn Redpolls and Twites were unusually numerous, Yellow-browed Warblers earlier than usual and four Sabine's Gulls had been seen. For the third year in succession Spurn Bird Observatory has produced its separate report. The Committee and the Spurn Warden are to be congratulated both on the excellence of the 1966 Report and the promptness with which it has again appeared.

Whilst the Protection of Birds Act Committee has held only one meeting during the year, it has been very active in a number of directions. Schools throughout the county have received posters outlining the basic principles of the 1954 Protection of Birds Act. An appeal has been launched for funds for protection work and is already showing a pleasing response. A list of those who have so far subscribed was displayed at the October Joint Vertebrate Sections Meeting. A further Act became law in 1967 and the Hon. Secretary is engaged in summarising this for the information of members.

The Reports Committee met formally in March and November, as well as informally on a number of occasions when the attendance of members at some event made further discussions convenient. The process of circulating and commenting on records is, of course, a continuous one — and often enlightening. I am sorry to say that it is still not possible to forecast when the Ornithological Reports for 1965 and 1966 will be in members' hands, but I can assure you that the committee has been spending considerable time and effort on this problem. After consultation with the Editor of *The Naturalist* and with the Y.N.U. Executive it has been decided to print the 1965 and 1966 reports together, but separate from the quarterly issues of *The Naturalist*. Members will be informed as soon as these reports are available. The committee was represented at a conference for Editors of local reports organised by the British Trust for Ornithology, in September.

In March, the Section held a joint meeting with the Bradford Naturalists' Society at the Connaught Rooms, Bradford, when George Waterston gave a lecture 'Expedition to West Greenland, 1965'. We are indebted particularly to Mrs. Butcher of the Bradford Society and to Mr. J. K. Fenton for the arrangements for this highly successful event.

R.S.P.B. films are now shown with a fair degree of regularity in various centres in the county, but it was something of an event when Bradford was included in an autumn tour during which a number of the R.S.P.B. staff themselves attended and showed the Society's three 1967 releases. For the first time, too, the Royal Society for the Protection of Birds had a stand at the Great Yorkshire Show from 11th to 13th July, when they were ably assisted by members of the Harrogate Naturalists' Society. At the second Harrogate Festival of Arts and Sciences during August, when the theme was 'Nature and Man' the Harrogate Society staged a number of ornithological exhibits. Yorkshire Ornithology is to be the theme of one of the sessions at the 1967 B.T.O. Conference at Swanwick.

On 24th September, a bird-watching sea-cruise from Scarborough was arranged for the second year in succession. Sooty Shearwaters and Little Gulls were among the birds seen. The migration of no fewer than 150 ornithologists to Scarborough for the occasion is an indication both of how worth-while members consider this project and how greatly indebted we are to A. J. Wallis for making the necessary arrangements.

By contrast, attendance of ornithologists at the field meetings of the Union during this past year has been more lamentable than ever. The field meetings are among the most important engagements in the Y.N.U. calendar and I cannot too strongly urge members to remedy this situation, nor too strongly stress the importance of exploring areas normally not well covered. Their bird-life should be adequately recorded on these occasions.

If I may be permitted to end on a personal note, I particularly regret that after twelve years as secretary of the Ornithological Section I have felt compelled to resign just at the time when the Union President will be an ornithological one. I feel sure that members will accord their loyal support both to James Fisher, the 1968 Y.N.U. President, and to my successor as secretary who will be M. Densley, of 50 Carr Manor View, Leeds 17.

CONCHOLOGY

(E. Dearing): The section has held five meetings in Leeds City Museum by kind permission of the Director. There have been four sectional field excursions but members have not attended the Y.N.U. excursions on as many occasions as would be desirable.

Mr. J. Armitage has been responsible for addresses on two occasions; in November he spoke on *Pomatias elegans* and in January dealt comprehensively with *Lymnaea*. Mrs. N. F. McMillan described the 1965 International Malacological Congress, held in Denmark, and Mr. E. Thompson showed many coloured slides of 'Molluscan habitats'.

The weather proved unkind on the occasions of meetings at Ryhill in April, Tadcaster in May and Skipton in October. Heavy rain on each occasion made collecting unpleasant although the Tadcaster meeting was enlivened by a lunch arranged in congenial surroundings. At Wentbridge in September three areas were visited: *Helix pomatia* was not found at its habitat but a revisit to the area by Mr. R. Carr produced *Helicella itala*, new to the area. Perhaps the most important find during the year has been that of *Arion lusitanicus* new to Yorkshire, found in Leeds City by Messrs. Armitage and Norris. Mrs. M. Fogan took *Vitrea subrimata* Reinhardt in May 1966 in Oxenber Woods, Austwick and this has proved to be new to Britain.

The following species have been observed by members of the Section, particularly Mrs. M. Fogan and Messrs. A. Norris, S. A. Appleyard, E. Robinson, E. Thompson and R. Carr who have kindly supplied lists.

The localities are as follows: (1) Bolton-by-Bowland, (2) Road to Stocks Reservoir, (3) Near to Tosside; on the occasion of the Y.N.U. visit in 1966, (4) Near Gunthwaite, (5) Pond on Emroyd Common, Dewsbury, (6) Bishop's Dyke near Sherburn-in-Elmet, (7) Woods near Ledsham, (8) Coxley Valley, near Dewsbury; all 1966 records: (9) Blubberhouses, Sept. 1966, (10) Birken, (11) Selby Canal, (12) Roche Abbey, (13) Leeds City, Oct. 1966, (14) Wintersett and Ryhill, 8.4.67, (15) Wentdale, 2.9.67, (16) Tadcaster, and (17) Bolton Percy, 6.5.67, (18) Oxenber Woods, Austwick, records from May 1966.

Viviparus viviparus (L.), 14
V. fasciatus (Müller), 10
Valvata piscinalis (Müller), 14, 17
Potamopyrgus jenkinsi (Smith), 2, 14, 16
Bythinia tentaculata (L.), 14, 17
B. leachi (Sheppard), 14, 17
Carychium minimum Müller, 1, 4, 16, 17
C. tridentatum (Risso), 15, 18
Lymnaea truncatula Müller, 16, 17, 18
L. glabra (Müller), 10, 14
L. palustris (Müller), 14, 17
L. stagnalis (L.), 14
L. auricularia (L.), 14
L. peregra (Müller), 14, 17
Aplexa hypnorum (L.), 17
Physa fontinalis (L.), 5, 17
Planorbarius corneus (L.), 11
Planorbis carinatus Müller, 14
Planorbis planorbis (L.), 14
P. vortex, (L.), 14
P. leucostoma Millet, 14, 17
P. albus Müller, 6, 14, 16
Segmentina complanata (L.), 14
Acoloxus lacustris (L.), 14
Succinea putris (L.), 1, 15, 17
Cochlicopa lubrica (Müller), 1, 9, 14, 15, 161, 17, 18,
C. lubricella (Stabile), 15, 16, 18
Pyramidula rupestris (Drap.), 1, 2, 3, 18
Pupilla muscorum (L.), 1
Lauria cylindracea (da Costa), 1, 9, 15, 18
Abida secale (Drap.), 18
Acanthinula aculeata (Müller), 18
Vallonia costata (Müller), 15
V. pulchella (Müller), 17

Ena obscura (Müller), 12, 15, 18
Marpessa laminata (Montagu), 7, 15, 18
Clausilia bidentata (Ström), 15, 18
Balea perversa (L.), 2
Cecilioides acicula (Müller), 8, 12
Arianta arbustorum (L.), 3, 18
Helix hortensis (Müller), 1, 15
H. nemoralis L., 1, 14, 15, 16, 17
H. aspersa Müller, 1, 15, 16
Hygromia striolata (C. Pfeiffer), 1, 9, 15, 16, 17, 18
H. hispida (L.), 1, 9, 14, 15, 16, 17
Monacha cantiana (Montagu), 15, 16
Helicella itala (L.), 15
Discus rotundatus (Müller), 1, 9, 14, 15, 16, 17, 18
Arion intermedius Normand, 14, 15, 16, 18
A. circumscriptus Johnston, 14, 15, 16, 17, 18
A. hortensis, Férussac, 9, 14, 15, 16, 17
A. subfuscus (Draparnaud) 9
†*A. lusitanicus*, Mabille, 13
New to Yorkshire
Euconulus fulvus (Müller), 1, 9, 15, 17, 18
Vitrea crystallina, (Müller), 17, 18
†*V. subrimata* Reinhardt, 18
New to Britain.
V. contracta (Westerlund), 14, 15, 18
Oxychilus draparnaldi (Beck), 15
O. cellarius, Müller, 1, 14, 15, 16, 17, 18
O. helveticus (Blum), 1, 15
Retinella radiatula (Alder), 8, 18
R. pura (Alder), 1, 9, 15, 18
R. nitidula (Draparnaud), 9, 16, 17, 18
Zonitoides excavatus (Alder), 14
Vitrina pellucida (Müller), 9, 15, 18
Milax budapestensis (Hazay), 16
Limax maximus L., 1, 14, 15
L. flavus L., 13
Lehmannia marginatus Müller, 9
Agriolimax reticulatus Müller, 1, 9, 14, 15, 16, 17, 18
A. laevis (Müller), 14, 17
Anadonta anatina (L.), 14
Sphaerium rivicola (Lamarck), 11
S. corneum (L.), 14, 15
Pisidium casertanum (Poli), 14
P. personatum Malm, 14, 17
P. obtusale (Lamarck), 14
P. milium Held, 17
P. subtruncatum Malm, 14, 17
P. henslowanum (Sheppard), 14
P. nitidum Jenyns, 14
Dreissena polymorpha C. Pallas, 14

Nomenclature is according to the *Census of the Distribution of British Non-Marine Mollusca*, 1951.

ENTOMOLOGY

Coleoptera (E. W. Aubrook): Continuing study of the more difficult genera amongst the Coleoptera, and collecting in comparatively little-worked localities, have resulted in the inclusion in this report of 15 species new to Yorkshire and 43 new to one vice-county or another. Mr. C. Johnson's recent work on the genus *Acrotrichis* has enabled three species of these minute beetles to be added to the British list from Yorkshire localities. An additional species was first recognised as British from specimens collected in the Stocksmoor Nature Reserve.

Master Jeremy D. H. Flint's enthusiastic collecting of water-beetles has resulted in a useful increase in our knowledge of the distribution of this group, notably of *Acilius canaliculatus* Nic. from Skipwith, *Agabus affinis* Payk. from Strensall and *Ilybius subaeneus* Er. from Haw Park Canal, all little-known species in the county.

The following collectors, in addition to the writer, are indicated by initials: Jeremy D. H. Flint, J. H. Flint, F. Hawkin, C. Johnson, P. Skidmore, D. E. Whittaker.

Carabus nitens L. (64) Dallowgill Moor, 17/4/67; E.W.A.
**Dyschirius politus* Dej. (62) Strensall Common, 29/4/67; H.E.F.
**Trechoblemus micros* Hbst. (63) Denaby Ings, in flood refuse, 16/5/67; F.H.
**Agabus affinis* Payk. (62) Strensall Common, 2/8/67, soft example swept; J.H.F. and 10/67 abundant, J.D.H.F.
**Ilybius subaeneus* Er. (63) Haw Park Canal, 6/5/67; J.D.H.F.
**Acilius canaliculatus* Nic. (61) Skipwith Common, 10/6/67 and 2/9/67; J.D.H.F.
**Hydraena britteni* Joy (64) Askham Bog, 3/4/65; E.W.A.
**Cercyon convexiusculus* Steph. (64) Askham Bog, 1/5/60; E.W.A.
Leptinus testaceus Mull. (62) Helmsley, 17/2/67, in mole's nest; A. Gordon.
**Agathidium seminulum* L. (62) Langdale End, 28/10/66; D.E.W.
**Calyptomerus dubius* Marsh. (64) Copgrove, 12/7/67; E.W.A.
Euthia scydmaenoides Steph. (64) Copgrove, 12/7/67; C.J.
**Acrotrichis stomaria* Deg. (63) Warp Farm, Thorne, 12/6/66; E.W.A.
**A. danica* Sundt. (63*) Oaklands, Huddersfield, 10/11/45; E.W.A.: Stocksmoor Reserve, 24/2/66; E.W.A. (62*) Throxenby Mere, 26/6/66; E.W.A.
†*A. henrici* Matth. (63) Denaby Ings, 15/3/66; C.J., E.W.A. The first British specimens.

†**A. insularis* Mak. (63) Roche Abbey, 27/10/65; C.J.: Farnley Moor, 25/4/66; E.W.A. (64*) Copgrove, 12/7/67; C.J. The first British specimens.

**A. intermedia* Gyll. (64) Copgrove, 12/7/67; C.J.

**A. montandoni* All. (64) Copgrove, 12/7/67; C.J.

†*A. norvegica* Str. (64) Studley, 6/7/66; C.J.: Copgrove, 12/7/67; C.J.

†**A. strandi* Sundt. (64) Askham Bog, W. D. Hincks: *loc. cit.*, 15/6/66; E. W. A. (62*) Throxenby Mere, 26/6/66; E.W.A. The first British specimens.

**Ptiliolum kunzei* Heer. (64) Malham, 6/7/67; C.J.

**Ptinella aptera* Guer. (64) Copgrove, 12/7/67: C.J.

**P. denticollis* Fair. (64) Copgrove, 12/7/67; C.J.

Pseudopsis sulcata Newm. (64) Copgrove, 12/7/67; E.W.A.

†*Xylostiba monilicornis* Gyll. (63) Stocksmoor Reserve, 4/11/66; E.W.A. A Scottish species no doubt introduced in timber.

†*Lathrobium fovulum* Steph. (64) Askham Bog, 10/2/67, in mole's nest: E.W.A.

**Heterothops dissimilis* Grav. (64*) Copgrove, 12/7/67; E.W.A. (63*) Dalton, Huddersfield, 3/10/48: Farnley Tyas, 30/12/59; E.W.A.

H. praevia Er. (64) Copgrove, 12/7/67; C.J. The first Yorkshire record for many years.

Quedius xanthopus Er. (62) Helmsley, 2/10/62; E.W.A.

**Mycetoporus clavicornis* Steph. (61*) Skipwith Common, 17/5/65; E.W.A. (62*) Copgrove, 12/7/67; C.J.

**Habrocerus capillaricornis* Gr. (64) Sleningford Park, 1/4/67: Copgrove, 12/7/67; E.W.A.

**Leptusa fumida* Er. (64) Copgrove, 12/7/67; C.J.

†*Atheta alpestris* Heer. (64) Penyghent, 6/7/67; C.J.

**A. melanocera* Thoms. (64) Sawley, 16/4/67; E.W.A.: Askham Bog, 25/4/67; C.J.

**A. obtusangula* Joy (63) Gunthwaite, 1948; E.W.A.: Sawley, 15/4/67; E.W.A.

**A. nigricornis* Thoms. (63) Stocksmoor Reserve, 9/5/67; E.W.A.

†*A. harwoodi* Will. (63) Stocksmoor Reserve, 9/5/67, in carrion; E.W.A.

**A. sodalis* Er. (64) Askham Bog, 10/2/67, in mole's nest; E.W.A.

†**A. nidicola* Johan. (62) Dalby Forest, 10/66, in sparrow-hawk's nest; G. Simpson (64*) Askham Bog, 20/4/67; C.J.

**A. hypnorum* Kies. (64) Askham Bog, 20/4/67; C.J.

**A. longicornis* Grav. (63) Shepley, 30/4/67, in pig dung; E.W.A.

†*A. pygmaea* Grav. (64) North Stainley, 1/4/67; E.W.A.

†*A. subsinuata* Er. (64) North Stainley, 1/4/67; E.W.A.

**Oxypoda haemorrhoa* Mann. (64) North Stainley, 1/4/67; E.W.A.

†*O. nigricornis* Mtsch. (64) Malham, 13/9/67; C. J. A montane species recently added to the British list.

**Ocalea picata* Steph. (64) Sawley, 15/4/67; E.W.A.

**Ocyusa maura* Er. (64) Penyghent, 6/7/67; C. J.

Lampyris noctiluca L. (62) Langdale Valley, May, 1964; D.E.W. The glow-worm has been recorded rarely in recent years.

**Korynetes caeruleus* DeG. (63) Sprotborough, 29/5/67; R. Crossley.

†*Triplax russica* L. (63) Hatfield Moors, 5/1967: Thorne Waste, 25/6/67; P.S.

**Atomaria lewisi* Reitt. (61) nr. Barmston, 13/7/67; E.W.A.

**A. prolixa* Er. (63) Secker, 8/5/67; F.H.

**A. munda* Er. (63) Bradley, nr. Huddersfield, 12/4/67; E.W.A.

**Synchita humeralis* F. (63) Hatfield Moors, 5/67, one on *Daldinia*; P.S.

**Harmonia quadripunctata* Pont. (63) Low Farm, Armthorpe, 12/8/67; P.S.

**Hypophloeus unicolor* Pill. & Mitt. (61) Skipwith, 4/7/67, under birch bark; P.S.

Hoplia philanthus Fuess. (64) Kettlewell, 29/6/66; M. Brook. An uncommon species in Yorkshire.

Eremotes ater L. (62) Langdale Valley, 1966; D.E.W.

Dorytomus longimanus Forst. (63) Armthorpe, 6/67, on Lombardy poplar; P.S.

Hemiptera (J. H. Flint): This has not been an outstandingly productive year but there are some interesting additions to the county list and a very welcome increase in the number of records from V.C. 63 as a result of the work of Mr. Crossley. Some of the outstanding species have been taken in well-known haunts, Spurn, Skipwith Common, Thorne and Hatfield, but there is an interesting series of records from the disused canal at Haw Park near Wakefield and from a pond near Langsett. Neither the canal nor the Langsett pond appear to have been investigated before and it is clear that while there is more to find in even the most thoroughly explored places such as Spurn, the search for new areas of interest can be amply rewarding.

There are four species to add to the county and eleven to the vice-county lists. Initials are those of the recorder and Mr. R. Crossley.

HETEROPTERA

**Acompus rufipes* (Wolff) (63) Wilthorpe Marsh, Barnsley, 25/8/67; R.C. Haw Park, 8/10/67; R.C.

†*Chlamydatus saltitans* (Fall.) (61) Spurn, brachypters and a macropterous female on the dried salt-marsh, 18/6/67; Mrs. H. E. Flint.

Heterocordylus tibialis (Hahn) (63) Blaxton, 15/7/67; R.C.

**Neomecomma bilineatus* (Fall.) (63) Haw Park, on aspen, in abundance, 8/67; J.H.F.

Lygus pratensis (L.) (62) Cornelian Bay, Scarborough, 23/8/60; J.H.F. (64) Queen Mary's Dubbs, Ripon, 25/6/55; W. D. Hincks (det. J.H.F.).

†*L. punctatus* (Zett.) (65) Swinton Park, Masham, 11/10/47; W. D. Hincks (det. J.H.F.).

**Megaloceraea recticornis* (Geoff.) (62) Cayton Bay, 8/58; J.H.F.

**Teratocoris viridis* D. & S. (63) Cupwith Hill, Huddersfield, at 1,400 ft. on sedges, 13/7/66; R.C.

Salda morio Zett. (63) Cupwith Reservoir, Huddersfield, commonly at 1,250 ft. 17/7/67; R.C.

Saldula scotica (Curt.) (63) Little Don, Langsett, 30/7/67; R.C.

†*Hebrus ruficeps* (Thoms.) (61) Skipwith Common, in *Sphagnum*, 24/3/67; P.S.

Hydrometra stagnorum (L.) (63) Canal at Haw Park, 23/9/67; Jeremy D. H. Flint.

Microvelia reticulata (Burm.) (63) Canal at Haw Park, in abundance 8/10/67; P.S.

**Notonecta maculata* F. (63) Quarry pond at Langsett, 26/2/67 and subsequently, in company with *N. obliqua* Gall. and *N. glauca* L.; P. Skidmore and R. C.

**Micronecta poweri* (D. & S.) (63) Cannon Hall Park, Barnsley, 1/7/67; R.C. Previously recorded from here, 18/6/50, (*Naturalist*, 1964: 23) as *M. scholtzi* (Fieb.) in error.

**Arctocorisa germari* (Fieb.) (63) Cupwith Reservoir, Huddersfield, 25/9/67; R.C.

Sigara distincta (Fieb.) (61) Huggate, 10/6/67; R.C.

S. falleni (Fieb.) (63) Newmillerdam Lake, 20/5/67; Jeremy D. H. Flint.

S. limitata (Fieb.) (61) Huggate, 10/6/67; R.C.

**S. semistriata* (Fieb.) (64) Barlow, near Selby, 7/3/67; J.H.F.

HOMOPTERA

Eurhadina loewi (Then) (64) Meanwood Valley, Leeds, 9/67; J.H.F. Only the second locality found in Yorkshire. The colony originally found in Gledhow Valley, Leeds, is still thriving.

†*Chloriona dorsata* Edw. (61) Spurn, 18/6/67; J.H.F. Apparently recorded from only three other places in Britain.

**Ditropis pteridis* (Spin.) (63) Thorne Waste, 25/6/67; J.H.F.

**Criomorphus albomarginatus* Curt. (61) Spurn, 18/6/67; J.H.F.

Hymenoptera (J. H. Flint): Collecting trips have not been very successful this year but insufficient work has been done to attribute this to a scarcity of insects. Some of the arrears of identification were cleared during winter months so this report consists in large part of records from past seasons' collecting. Material has been received from Mr. M. T. Brooks, Mr. R. Crossley and Mr. C. I. Rutherford but most of the species listed here have been collected by my wife (H.E.F.) or myself. I am responsible for the determinations.

SYMPHYTA

**Cephus cultratus* Evers. (62) Strensall Common, 31/5/64; J.H.F.

**Strongylogaster macula* (Klug) (64) Lindley Wood, Washburn Valley, 25/5/60; H.E.F.

†*Aneugmenus furstenbergensis* (Konow) (64) Lindley Wood, 29/5/60; H.E.F.

**Dolerus pratensis* (L.) (63) Gunthwaite, 3/6/66; R.C.

**Monosoma pulverata* (Retz) (64) Askham Bog, 18/5/60; Mrs. J. Payne.

†*Empria excisa* (Thoms.) (64) Golden Acre, Leeds, 7/6/62; J.H.F.

**Allantus calceatus* (Klug) (63) Thorne Waste, 3/6/62; H.E.F.

**Ardis brunniventris* (Hart.) (62) Cayton Bay, 16/8/61; J.H.F.

**Halidamia affinis* (Fall.) (64) Breary Marsh, Leeds, 28/5/63; J.H.F.

**Tenthredopsis excisa* (Thoms.) (61) Allerthorpe Common, 10/6/67; J.H.F.

**Hoplocampa crataegi* (Klug) (63) Haw Park, near Wakefield, 29/5/67; J.H.F.

**Pristiphora crassicornis* (Hart.) (64) Shadwell, Leeds, 27/7/63; J.H.F.

**Amauronematus histrio* (Lep.) (64) Shadwell, Leeds, bred from larvae taken on *Salix fragilis*, emerged 6/6/62; J.H.F.

**A. viduatus* (Zett.) (62) Strensall Common, 28/4/64; J.H.F.

**Pontania collactanea* (Forst.) (61) Skipwith Common, typical galls on the leaves of *Salix repens*, 2/9/67; H.E.F.

†*Nematus hypoxanthus* Forst. (64) Shadwell, Leeds, 27/7/63; J.H.F.

**N. incompletus Forst.* (64) Hubberholme, 16/6/64; H.E.F.

†*N. salicis* (L.) (64) Fairburn Ings, 9/6/63; H.E.F.

Aculeata

**Anoplius fuscus* (L.) (62) Strensall Common, 30/4/66; J.H.F.

**A. concinnus* (Dahl.) (61) Skipwith Common, 7/67; J.H.F.

**Ancistrocerus antilope* (Pz.) (64) Harrogate, 3/6/66; C.I.R.

**Crossocerus pubescens* (Shuck.) (63) Thorne Waste, 25/6/67; J.H.F.

†*Rhopalum coarctatum* (Scop.) (63) Thorne Waste, 25/6/67; J.H.F.

Diptera (P. Skidmore): The Diptera remain a relatively unworked group in our area and hence it is possible to be able to report a fair number of new county and vice-county records (17 and 47 respectively). Some of the records hail from earlier years when the writer was living in Lancashire and collecting in the Slackcotes valley between Delph and Denshaw (V.C. 63). We are indebted to all who have submitted their records but especially to Mr. L. N. Kidd, of Werneth Park Study Centre, Oldham, for his records of Mycetophilidae collected at Sandall Beat Wood, Doncaster, on 9/10/67: others to whom thanks are offered for their records are Messrs. A. G. Boulton, R. Crossley, C. Devlin, and C. I. Rutherford. Specimens collected by Messrs. Boulton, Devlin and Skidmore have been incorporated into the collections of the Doncaster Museum and Art Gallery.

**Phalacrocera replicata* (L.) (63) Abundant every year in the dam at Linfitts, Slackcotes valley: 1♂ Thorne Waste, 25/6/67; P.S.

**Bolitophila hybrida* (Mg.) (63) Several males at Sandall Beat Wood; L.N.K.

Macrocera vittata (Mg.) (63) 1♂ 1♀ Sandall Beat Wood; L.N.K.

**Mycomya winnertzii* (Dziedzicki) 1♂ Sandall Beat Wood; L.N.K.

**M. hyalinata* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.

M. cinerascens (Mcq.) (63) 1♂ Sandall Beat Wood; L.N.K.

**M. incisurata* (Zett.) (63) 1♀ Sandall Beat Wood; L.N.K.

**M. flava* Stannius (63) Both sexes common at Sandall Beat Wood; L.N.K.

Acnemia nitidicollis (Mg.) (63) 1♀ Sandall Beat Wood; L.N.K.

Boletina trivittata (Mg.) (63) 1♀ Sandall Beat Wood; L.N.K.

†*Synapha vitripennis* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.

Tetragoneura sylvatica (Curtis) (63) 1♀ Sandall Beat Wood; L.N.K.

†*Exechia fusca* (Mg.) (63) Several of both sexes at Sandall Beat Wood; L.N.K.

†*E. nana* (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.

**E. contaminata* Winnertz (63) ♀♂ Sandall Beat Wood; L.M.K.

**E. subulata* Winnertz (63) 1♀ Sandall Beat Wood; L.N.K.

**Allodia lugens* (Wiedemann) (63) 1♂ Sandall Beat Wood; L.N.K.

**A. oranticollis* (Mg.) (63) 1♂ Sandall Beat Wood; L.N.K.

A. griseicollis (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.

**Brachypeza helvetica* (Walker) (63) 1♀ Sandall Beat Wood; L.N.K.

†*Cordyla flaviceps* (Staeger) (63) 1♂ Sandall Beat Wood; L.N.K.

Mycetophila fungorum (DeG.) (63) 1♀ Sandall Beat Wood; L.N.K.

M. guttata Dziedzicki (63) Several of both sexes at Sandall Beat Wood; L.N.K.

**Bolitophila hybrida* (Mg.) (63) Several males at Sandall Beat Wood; L.N.K.

**Beris clavipes* (L.) (63) A common insect in bushy places; Slackcotes, Gunthwaite, Doncaster; P.S.

Symphoromyia crassicornis (Panzer) (63) Mainly a moorland species, this fly is frequent in Slackcotes in June most years; 2♂ Wilthorpe Marsh, near Barnsley, 3/7/67; P.S., R.C.

Scenopinus fenestralis (L.) (63) This fly occurs periodically on the windows in Doncaster Museum & Art Gallery.

†*Tachytrechus notatus* Stannius (63) 1♂ 1♀ Denaby Ings, 26/8/67; P.S., A.G.B.

Xylota xanthocnema Collin (63) 1♀ Edlington Wood, 18/6/66; C. I. Rutherford. One previous Yorkshire record (*Naturalist,* 1966; 18)

**Physocephala rufipes* deGeer (63) One swept from edge of scrubland at Haw Park, 8/67; R.C. Only recorded singly from V.C. 61 and 62.

Melieria crassipennis Fabricius (63) A common species in the marshes of the lower reaches of the Dearne and the Don. Several at Wilthorpe Marsh near Barnsley on 3/7/67; P.S., R.C.

**Ceroxys urticae* (Linnaeus) (63) Frequent in old marshes with the previous species:—Adwick-le-Street, summer 1965; H. E. Beaumont. Denaby Ings, frequent in June and July 1966 and 1967; C.J.D., P.S. Wilthorpe Marsh, 3/7/67; P.S., R.C.

**Chyliza leptogaster* (Meigen) (63) 1♂ Auckley, 24/5/67; 1♀ Hooton Roberts, 8/7/67; P.S.

†*Minettia longipennis* (Fabricius) (63, 64) A fairly common species in woodlands; specimens in Doncaster Museum from Hooton Roberts, 8/7/67; Copgrove Park (64), 14/7/67, and Wilton Park, Batley, 11/8/67; P.S.

**Pherbellia* (= *Sciomyza*) *albocostata* (Fallen) (63) A common species in woods amongst Dogs Mercury and Nettles, mainly on light or basic soils. Roche Abbey, Denaby Ings, Cadeby; P.S., C.J.D.

**P. scutellaris* (von Roser) (63) 1♂ Sprotborough, 17/7/67; 1♂ Sandall Beat Wood, 9/10/67; P.S.

**Phaeomyia fuscipennis* (Meigen) (63) Frequent amongst lush vegetation growing on light soils, expecially in woods; Cadeby, Roche Abbey, Denaby Ings; P.S., C.J.D.

**Trypetoptera punctulata* (Scopoli) (63) Frequent in bushy places on the magnesian limestone belt of V.C. 63; Sandbeck, Roche Abbey, Cadeby, Edlington Wood; P.S., C.J.D.

**Limnia rufifrons* (Fabricius) (63) Frequent in bushy places mainly on the magnesian limestone in V.C. 63; specimens in Doncaster Museum collection from Rossington Bridge, 15/7/65; P.S.

†*Heteropteryx brevipennis* (Zetterstedt) (63) 1♂ Denaby Ings, 26/8/67; C.J.D.

**Elgiva cucularia* (Linnaeus) (63) Frequent at Denaby Ings, Potteric Carr, Hatfield Moors, Blaxton Common; P.S., C.J.D. Mainly in old marshes.

**Helomyza* (= *Suillia*) *variegata* Loew. (63, 65) A common fly of damp shady woods; Roche Abbey, Sandall Beat Wood, Denaby Ings, Cadeby, Sprotborough, and High Force in Teesdale (65); P.S.

**H. notata v. hilaris* Zetterstedt (63, 65) By far the commonest large Helomyzid in northern England. In damp shady woods, Slackcotes, Roche Abbey, Cawthorne, Gunthwaite, Denaby Ings, Cadeby, Sandall Beat; P.S.

**H. ustulata* Meigen (63) A fairly common and distinctive large dark species of shady woods; Sandall Beat Wood, Roche Abbey, Cadeby; P.S.

**H. humilis* Meigen (63) Much more local than the preceding species but in similar situations; 1♂ 1♀ Sandall Beat Wood, 9/10/67, others seen; P.S.

†*H. infera* Collin (65) Common in the Grampians this fly is only known in England from the Teesdale-Crossfell area of the northern Pennines; several taken at High Force, 20/9/65; P.S.

†*Tephrochlamys tarsalis* (Zetterstedt) (63) Usually found in birds' nests, a single male of this species was beaten from a hawthorn hedge near Hatfield on 2/7/65; P.S.

†*Neoleria ruficauda* (Zetterstedt) (63) 3♀ High Force, Teesdale, 20/9/65; P.S. Taken from Fly Agaric (*Amanita muscaria*).

**N. inscripta* (Meigen) (63) A common fly which breeds in carrion—probably throughout the county—Slackcotes, Gunthwaite, Sandbeck, Roche Abbey; P.S.

**Morpholeria ruficornis* (Meigen) (65) 1♂ High Force, 20/9/65; P.S.

†*Anthomyza bifasciata* Wood (63) 1♂ Blaxton Common, 15/7/67; P.S. A very striking little fly, this is only recorded in the literature from the type locality in Herefordshire. On the Continent it is thought to be associated with *Typha* and indeed the above specimen was swept from this plant.

†*Phaonia atriceps* Loew (63) This fly is associated with *Typha* and *Glyceria* and should be sought wherever these plants abound. Previously considered an extreme rarity, it appears that this fly is locally common. Adults reared from puparia found in *Typha* at Potteric Carr and Blaxton Common in spring 1967 and adults found in great abundance at Denaby Ings on 26/8/67; P.S.

P. trigonalis* Meigen (=*laetabilis* Collin) (64) 1♀ Copgrove Park, 14/7/67; P.S. Collin (*Ent. Rec.* 1949: **63: 2.) mentions a Yorkshire record without further data, but this record is not on the Yorkshire Card Indexes of Cheetham and Fordham.

†*Mydaea detrita* (Zetterstedt) (61) 2♂ Skipwith Common, 4/7/67; P.S.

†*Schoenomyza litorella* (Fallen) (63) Generally abundant in Slackcotes Valley; P.S.

**Eustalomyia histrio* (Zetterstedt) (61) Several on birch trunk at Skipwith Common, 4/7/67; A. G. Boulton.

**Lipara lucens* Meigen (63) Galls of this species were collected from Torne bridge and Potteric Carr during spring of 1967 and adults were reared. A characteristic fly of old fens, this fly was previously only known in Yorkshire from V.C. 61 and 64; P.S.

†*Megaphthalma pallidum* (Fallen) (63) 1♂ Slackcotes Valley; P.S.

**Scatophaga lutaria* Fabricius (63) A very common dung fly in most places, though less frequent in open moorlands. Throughout V.C. 63, Slackcotes, Gunthwaite, Cawthorne, Roche Abbey, Thorne Waste, Hatfield Moors, Denaby Ings, Potteric Carr; P.S.

**S. squalida* Meigen (63) Another common species but this one is dominant in the higher parts of the Pennines. Less common in lowland areas.

†*Amaurosoma flavipes* (Fallen) (63) Common at Denaby Ings, first collected on 8/6/66 and noted often since; P.S., C.J.D.

†*A. armillatum* (Zetterstedt) (63) With previous species.

**Epicampocera succincta* (Meigen) (63) Frequent at Slackcotes in August; P.S.

**Paraphorocera stabulans* (Meigen) (63) Generally common: Slackcotes, Edlington Wood, Barnby Dun; P.S. Denaby Ings; C.J.D.

**Thelaira leucozona* (Panzer) (63) Generally common: Slackcotes, Roche Abbey; P.S. Old Denaby; C.J.D.

**Phyllomya volvulus* (Fabricius) (63) Common in woodlands east of the Pennines where chafer beetles occur: Edlington Wood, Cadeby, Sprotborough, Sandall Beat Wood, Roche Abbey, Cawthorne; P.S.

**Tachina rustica* Fallen (63) 1♂ Hatfield, 11/7/65; T. M. Clegg.

**Nemorilla floralis* (Fallen) (63) 1♂ Potteric Carr, 12/8/65; P.S.

**Anachaetopsis zetterstedti* Ringdahl (63) 1♀ Rossington Bridge, 15/7/63; P.S.

**Macquartia tenebricosa* (Meigen) (63) 2♂ 1♀ Rossington Bridge, 15/7/65; P.S.

**Sarcophaga frenata* Pandelle (63) Several at Potteric Carr, 5/8/65; P.S.

**Cynomya mortuorum* (Linnaeus) (63) Sparingly most years at Slackcotes in summer; P.S.

**Acrophaga subalpina* (Ringdahl) (63) Frequent in woodlands: Slackcotes, Potteric Carr, Roche Abbey, Sandall Beat Wood, Cadeby and Sprotborough, Denaby Ings; P.S.

Lepidoptera (S. M. Jackson): Once again I must report a rather poor season. In spite of a good summer, many species were down in numbers, possibly the chief reason being the mild winter of 1966–7 followed by a cool spring. In particular, it has been a poor year for migrants and I have no report of either the Painted Lady or Clouded Yellow butterflies. There have also been fewer contributors this year, so my thanks are due to the following for their records the more important of which are listed below; J. Armitage, J. Briggs, J. H. Flint, C. R. Haxby, A. M. R. Heron, W. Jagger, E. Richards, G. Simpson, P. Skidmore, C. C. Smith, P. G. Tannett and P. Winter.

Euchloe cardamines L. (Orange Tip) About the usual numbers seen in the Selby district; S.M.J. (62) Pickering, 29/5/67; G.S. A few near Lake Gormire, 10/6/67; S.M.J. (64) Micklefield, 6/67; S.M.J.

Argynnis aglaia L. (Dark Green Fritillary) (62) Gundale, several 22/7/67; S.M.J.

A. euphrosyne L. (Pearl-bordered Fritillary) (62) Newtondale, 6/67; E.R. It has been a poor year for this species which appears to be getting scarcer. In three localities which I (S.M.J.) visited in June and where it used to abound, I did not see a single insect.

A. selene Schiff. (Small Pearl-bordered Fritillary) (62) Still persisting on Skipwith Common, 18/6/67; S.M.J.

Nymphalis io L. (Peacock) Appears to have had a very poor year, the only records which I have being of single insects. (61) Ellers Wood, 14/4/67; G.S. (62) Muston, Filey, 11/9/67; P.W. (64) near Selby, 8/67; S.M.J.

Vanessa atalanta L. (Red Admiral) Very scarce this year. Several members report odd insects only although several were seen in the Scarborough area by P.W.

Maniola tithonus L. (Gatekeeper) (63) Present in some quantity in the Thorne area, 8/8/67; A.M.R.H.

Strymonidia w-album Knoch (White-letter Hairstreak) (61) Larvae beaten from Wych Elm near Malton, 29/5/67; S.M.J.

Lycaena phlaeas L. (Small Copper) A very poor year for this species, the numbers observed being down everywhere.

Arica agestis Schiff. (Brown Argus) (62) A few noted in Gundale, Pickering, 17/6/67; S.M.J. Plentiful in the same locality, 22/7/67; J.A. (64) Widespread round Grass Wood and Dib Scar, 25/7/67; J.B.

Pyrgus malvae L. (Grizzled Skipper) (61) Noted again on railway banks at South Cave; E.R.

Acherontia atropos L. (Death's Head Hawk) (63) One taken at East Bierley, Bradford, 11/9/67, by J.B., is the only record I have.

Herse convolvuli L. (Convolvulus Hawk) (63) One caught in car radiator near Batley, 11/9/67; J.B.

Cerura furcula L. (Sallow Kitten) (62) Hackness, 5/7/67; P.W.

Thyatira batis L. (Peach Blossom) Although this pretty moth turns up, often commonly, where a light is operated in the more sylvan districts it is rather rare in the industrial areas. (63) Birkenshaw, Bradford, one 12/7/67; W. J. (J.B.).

Tethea ocularis L. (Figure of Eighty) (61) I first took this moth at Skipwith in 1965, my most northerly record. I was pleased to take the larva in the same locality this year; S.M.J.

Earias clorana L. (Green Pea) Since this insect was discovered by A. Steel in the Thorne area in 1962 it has been found to be more widespread than was originally thought. Larvae were found again this year in three separate localities in that region, 8/8/67; A.M.R.H.

Nudaria mundana L. (Muslin Footman) (64) Timble, 31/7/67; P.G.T. Rather local and probably overlooked.

Apatele alni L. (Alder) (64) Larva on Alder, Breary Marsh, Leeds, 22/8/67; C.C.S.

A. tridens Schiff. (Dark Dagger) (62) Larva taken at Muston, Filey, 9/67; P.W.

Lycophotia varia Vill. (True Lovers' Knot) (62) Muston, Filey, several 7/67; P.W. This common, exclusively heather-feeding moth continues to confound us by its habit of turning up at lights often miles from its normal heathy habitats. The present record is an example.

Amathes depuncta L. (Plain Clay) (62) Hackness, 8/8/67, a single moth taken at M.V. light; P.W. Rare in Yorkshire.

A. stigmatica Hubn. (Square Spot Clay) (62) Hackness, one taken at M.V. light, 8/8/67; P.W. This is the first record known to me for fifty years and one of the most important captures of the year.

Hadena conspersa Esp. (Marbled Coronet) (64) Chapel Allerton, Leeds, 6/67, to light; J.H.F. Headingley, Leeds, 1/7/67; C.C.S.

Bombycia viminalis F. (Minor Shoulder Knot) (64) Askham Bog, larvae on sallow, 2/6/67; C.C.S. The moth, which comes readily to light, is of the dark form. A local species in Yorkshire.

Apamea ipsilon Borkh. (Dingy Shears) (64) Selby Common, larvae behind bark of old willows; S.M.J.

Cosmia affinis L. (Lesser Spotted Pinion) (61) Malton, larvae beaten from elm, 29/5/67; S.M.J. Muston, Filey, one adult at light, 8/67; P.W.

Agrochola lychnidis Schiff. (Beaded Chestnut) (63) Birkenshaw, Bradford, four came to light, 3–8/67; W.J. Although a common insect in many parts of the county, it is rare in the industrial west.

Conistra ligula Esp. (Dark Chestnut) (61) Near Beverley, several at ivy bloom, 5/10/67; P.W. (62) Near Scarborough, at ivy bloom, 14/10/67; S.M.J.

Zanclognatha nemoralis F. (64) Selby, in garden, 7/67; S.M.J. Headingley, Leeds, at light 16/7/67; C.C.S.

Odezia atrata L. (Chimney Sweeper) Although very local and usually common enough where it does occur this moth is not often reported. (64) Bolton Abbey, a good colony, 29/6/67; A.M.R.H. Breary Marsh, very common, 2/7/67; C.C.S. Askham Bog, a few, 12/7/67; C.C.S.

Nothopteryx carpinata Borkh. (Early Tooth Stripe) (62) Forge Valley, Scarborough, frequent 6/67; P.W. A very local species in the county.

Thera firmata Hubn. (Pine Carpet) (62) Strensall, 27/8/67; C.C.S.

Xanthorhoe spadicearia Schiff. (Red Twin-Spot Carpet) (62) Hackness, and Muston, Filey, single examples, 8/8/67; P.W.

Perizoma albulata Schiff. (Grass Rivulet) (63) Little Horton, Bradford, at M.V. light, 12/7/67; J.B. (64) Selby Common, several 6/67, the first I have seen in the area for many years; S.M.J. Micklefield, on a hillside, 6/67; S.M.J.

P. minorata Treits. (Heath Rivulet) (64) Although C. I. Rutherford found this species abundantly at Dib Scar, Grassington, last year, J.B. and C.R.H. failed to note more than one or two on several visits last August.

Eupithecia haworthiata Doubl. (Haworth's Pug) (63) Larvae found in a new locality near Wentbridge where there is a surprising abundance of the food plant, *Clematis vitalba*; S.M.J.

E. fraxinata Crewe (Ash Pug) (63) Wentbridge, larvae, 22/7/67; S.M.J. Little Horton, Bradford, adult at M.V. light, 10/7/67; J.B.

E. exiguata Hubn. (Mottled Pug) (64) Askham Bog, larvae on hawthorn, 9/66 and 2/6/67; S.M.J.

E. pini L. (Cloaked Pug) (63) A single specimen, a large female, was taken by C. Denham at M.V. light at Bolton, Bradford, 14/6/66, and exhibited at the S. Lond. Ent. Nat. Hist. Soc. Exhibition, 28/10/67; C.R.H. There is some implied doubt in Porritt's reference to the single Yorkshire record of the last century and the origin of the present insect is also in doubt. Possibly it was introduced as ovum or pupa with spruce cones. It is, however, the only fully authenticated record I have.

Chiasmia clathrata L. (Latticed Heath) (63) Thorne Waste, 5/6/67; J.H.F. (64) Malham Tarn, two in moth trap, 21/7/67; J.B. Micklefield, on railway embankment, 6/67; S.M.J.

Selenia lunaria Schiff. (Lunar Thorn) (64) Grass Wood, 18/6/67; J.B. and C.R.H. Not very common in the district.

Cataclysta lemnata L. (63) Wilthorpe, several in canal, 2/7/67; Potteric Carr, 4/8/67; P.S.

Nymphula nympheata L. (63) Hooton Roberts, abundant in fish ponds, 8/7/67; P.S.

Pyralis farinalis L. (63) Armthorpe, 12/8/67; P.S.

Crambus ulignosellus Zell. (63) A single example on Hatfield Moors, late 5/67; A. G. Boulton (P.S.). Only the second Yorkshire record, the first being from Skipwith, 1895.

C. perlellus Scop. (63) Hatfield Moors, several, 15/7/67; P.S.

C. inquinatellus Schiff. (63) Potteric Carr, several, 9/8/67, and Denaby Ings, 26/8/67; P.S.

Nemotois degeerella L. (63) Hatfield Moors, numerous in small wood, 1/7/67; P.S.

Adela rufimitrella Scop. (63) Sandall Beat Wood, Doncaster, one, 24/5/67; P.S.

Cossus cossus L. (Goat) (65) Dishforth, one at M.V. light, 2/8/67; P. Kay (J.B.). Not often reported.

BOTANY

(Dorothy R. Walker): All reporters comment on the mildness of the winter with an absence of snow and frost. The mild January and February were responsible for some early records of flowering such as Lesser Celandine in the Middlesbrough area on 6th February and Primroses in Grass Woods on 5th March; but thereafter most reports agree that flowering was retarded by the cold weather and high winds of April and May.

From the East Riding it is reported that some species normally flowering in June and July were two to three weeks late in doing so this year. This applied to *Lathyrus palustris, Dactylorhiza incarnata, Orchis apifera* and *Linum anglicum*. One or two species however flowered early, *Thalictrum flavum* for instance being in full flower by the River Hull on 14th June. Aquatic plants were luxuriant by the waterways of the River Hull valley possibly due to heavy rain early in the season washing fertilisers into the drains and river, combined with warm conditions throughout much of the summer. Long periods of warmth and an abudance of water in the soil may account for many chalk-wold species continuing to flower in late August and well into September; *Centaurea scabiosa* was still in good flower on 16th September and flowers of Stemless Thistle on 22nd September.

Further north, around Thirsk, after the late spring, flowering is reported to have been poor in many species. Laburnums which appeared to behave normally in other parts of the north, produced no flower at all. Horse Chestnuts flowered badly with only a few spikes on each of the reporter's 50 trees, none of which fruited. Apples were the worst crop for many years, Damsons and Pears failed and the Plum crop was very poor. Brambles flowered profusely as they appear to have done over most of the county but, disappointingly, the fruit crop was later than and well below everage. Below average is also the summing up for the fruiting of Oak, Sycamore, Elm and Beech.

From Middlesbrough it is recorded that the cold March and April resulted in a poor showing of spring flowers but the warmer months of June and July brought an onrush of summer flowers, their season coming to an earlier end than usual. Garden flowers blossomed well this summer and in parks near the coast and the coastal regions generally there has been little evidence of damage by cold north-east winds blowing in during the summer months.

In upper Wharfedale, after the early setback caused by the cold and high winds, later flowering was good. In Grass Wood *Geranium sylvaticum* was conspicuous, *Serratula tinctoria* less so and *Hypericum montanum* had a poor season. *Galium boreale* was good on Dewbottom Scar.

From the Ilkley area the pattern of early flowering followed by a halt due to cold winds was repeated. Gorse, Broom, Sycamore, Oak, Hawthorn and Blackthorn all flowered well. Oak was in full leaf and some in flower before the first Ash leaves appeared. Some Sycamores started yellowing in the middle of August. Beech fruited and there were good crops of Hazel nuts.

From Otley it is reported that aquatic plants flowered freely in the lagoons. *Elodea canadensis* and *Myriophyllum spicatum* covered large areas with blooms above the water and Yellow Water-Lilies appeared and flowered well. One farmer began cutting hay in May and has had two lots of good hay and one crop — green for silage — from his four fields. The harvest of cereals has everywhere been good and the ploughing of cleared fields is well in hand. The recent emptying of the new Thruscross Reservoir has filled Fewston Reservoir to the brim and *Juncus filiformis* is now nearly all under water.

In the Bradford area, Horse Chestnuts are reported to have flowered poorly and apple crops were very poor, no doubt due to the wet and cold of May adversely affecting pollination. This certainly happened also in commercial tomato crops.

The report from Halifax states that the exceptionally mild winter allowed many plants to retain their foliage until very late and some normally tender plants survived the winter. Vegetation generally was retarded by the cold weather in April and the very wet May — the second wettest May on record there. From June onwards growth was normal though crops of most wild fruits were rather poor.

One tree not mentioned elsewhere in this report is the Lime. This is the tree most widely grown around all parts of Harrogate Stray where it flowered extremely well. The trees were heavy with blossom and later fruited equally well.

PLANT RECORDS: EAST RIDING (E. Crackles)

One of the most notable discoveries made in 1966 and not included in last year's report was *Carex polyphylla* found by Eric Chicken in Millington Wood. This is a new vice-county record. 1967 has been a most interesting year in East Yorkshire. The discovery of two localities for *Spiranthes spiralis* in the northern part of the wolds is of particular interest since the only previous mention of this species in the East Riding is in a manuscript herbal compiled by Rev. W. Whytehead while he was vicar of Atwick (1757–1817) which mentions the species as occurring on the coast at Atwick. Other records of note are for:— *Monotropa hypophegea,* near Elloughton; *Oenanthe fluviatilis* in the River Hull near Hempholme, this being a second vice-county record for this species; and the discovery of *Cirsium acaulon* in quantity in chalk grassland in two localities in the southern part of the wolds.

Contact has been made with two botanists in the Driffield area, Miss M. Taylor and Mr. J. Rushton, who have been active in the vice-county and who have provided a very interesting list of localities for uncommon species; some of these are included in this report. In all, additional records for a large number of species which are rare or very local in East Yorkshire have been reported this year.

Ophioglossum vulgatum L. Nafferton, 1966; J. Rushton and M. Taylor (J.R. & M.T.).
Ranunculus parviflorus L. Near Driffield; J.R. & M.T.
Papaver lecoqii Lamotte Rudston; E. Chicken (E.Ch.).
Papaver argemone L. Near Knapton; Mrs. Houseman.
Viola hirta x *odorata* = *V.* x *permixta* Jord. Near Tibthorpe; E. Crackles (E.C.)
Sagina maritima Don Coast path at Kilnsea; W. A. Sledge. Second East Yorks. record.
Malva neglecta Wallr. Driffield, 1964; J.R. & M.T.
Malva moschata L. Campdale, near Fordon and near Settrington; E.C.
Geranium columbinum L. Fordon; E.C.
Trifolium fragiferum L. Driffield, 1964; J.R. & M.T.
Astragalus danicus Retz. Langdale; J.R. & M.T.
Hippocrepis comosa L. Near Duggleby; Dr. D. Boatman.
Lathyrus montanus Bernh. Kexby, 1965; J.R. & M.T.
Aphanes microcarpa (Boiss. & Reut.) Rothm. Sandy track by Sands Wood, Wintringham; W. A. Sledge.
Myrrhis odorata (L.) Scop. Burton Fleming; E.Ch: Boynton; J.R. & M.T.
Pimpinella major (L.) Huds. Bridlington Priory; J.R. & M.T.
Oenanthe fluviatilis (Bab.) Colem. In the River Hull at Hempholme lock; E.C.
Silaum silaus (L.) Schinz & Thell. North Grimston; E.C.
Bryonia dioica Jacq. Brandesburton; E.Ch.
Monotropa hypophegea Wallr. Near Elloughton; E.C.
Lysimachia nemorum L. Between Bentley and Beverley; E.C.
Anagallis tenella (L.) L. Thornwick Bay; J.R. & M.T.
Samolus valerandi L. Thornwick Bay, 1964 and Emmotland, 1964; J.R. & M.T.
Blackstonia perfoliata (L.) Huds. Near Cowlam; J.R. & M.T.
Lithospermum officinale L. Lowthorpe, 1964; J.R. & M.T.
Veronica polita Fr. Near Scrayingham; C. M. Rob.
Thymus pulegioides L. Near Wharram, near Duggleby, Sherburn and Risby; E.C.
Legousia hybrida (L.) Delarb. Near Staxton; E.C.
Galium saxatile L. Near Bentley; E.C.: this is a rare plant in E. Yorks. east of Derwentland.
Cirsium acaulon (L.) Scop. In quantity on a hillside in Drewton Dale; also on Beverley Westwood, confirming an old record; E.C.
Centaurea cyanus L. Burton Raikes; J.R.
Butomus umbellatus L. River Hull bank, near Baswick; E.C.
Juncus subnodulosus Schrank Between Bentley and Beverley; E.C.
Luzula pilosa (L.) Willd. Between Bentley and Beverley; E.C.
Epipactis palustris (L.) Crantz Near Driffield; J.R. & M.T.
Epipactis helleborine (L.) Crantz Kexby, 1965; J.R. & M.T. and near Bentley, the leaves of some plants being abnormally narrow; E.C.
Spiranthes spiralis (L.) Chevall. Near Staxton; A. Newton & E.C.: Fordon; E.C.
Gymnadenia conopsea (L.) R. Br. Near Ruston Parva; J.R. & M.T.
Dactylorhiza incarnata (L.) Vermeul. Great Givendale; E.C.
Lemna gibba L. River Hull, near Hempholme lock; E.C.
Scirpus lacustris L. River Hull bank at Hempholme lock; E.C.
Blysmus compressus (L.) Panz. ex Link Great Givendale; E.C.
Carex binervis Sm. Between Bentley & Beverley; E.C.
Carex pallescens L. Between Bentley and Beverley; E.C.
**Carex polyphylla* Kar. & Kir. (det. E. C. Wallace) Millington Wood, 1966; E.Ch.
Vulpia bromoides (L.) Gray On a wall between Bentley & Walkington; E.C.
Calamagrostis epigejos (L.) Roth Between Bentley & Beverley; E.C.
Milium effusum L. Between Bentley and Beverley; E.C.

WEST RIDING: (F. Murgatroyd)

Lycopodium clavatum L. (65) Cautley Crags, Sedbergh 34/69; D. J. Tennant. Not marked in Atlas though previously recorded from here.
Equisetum hyemale L. (64) South bank of Nidd near Bilton; G. A. Shaw & F. E. Branson. Confirmation of 1896 record (see *Suppl. Fl. Yorks.*, 123) and omitted from Atlas.

Nuphar lutea (L.) Sm. (64) Knotford Nook lagoon, Otley; Mrs. Houseman. Presumably introduced.

Corydalis claviculata (L.) DC. (64) Dallow Gill 44/17; D. J. T. Not marked in Atlas.

Draba incana L. (64) Foxup Moor on rocks by cave 34/87; D. J. T. Not marked in Atlas.

Astragalus danicus Retz. (64) Near South Milford; E. Thompson.

Potentilla crantzii (Crantz) G. Beck ex Fritsch (64) Foxup Moor on rocks by cave; D. J. Tennant. White square in Atlas.

Alchemilla wichurae (Buser) Stefan. (64) Grass Woods and above Horton-in-Ribblesdale; D. J. Tennant.

Rosa sherardii Davies var. *omissa* (Déségl.) W.-Dod f. *resinosoides* (Crèp.) W.-Dod *R villosa* L. var *mollis* Sm. f. *caerulea* Woods and *R. canina* L. var *spuria* (Pug.) W.-Dod all det. Rev. G. G. Graham (64) Bramhope ponds; Miss R. Kilby and Mrs. Houseman.

Drosera rotundifolia L. (63) Erringdon Moor 34/92; Y.N.U. Excn. Not marked in Atlas.

Myosotis sylvatica Hoffm. (64) Healaugh & Wighill 44/44; T. F. Medd. Not marked in Atlas.

Mentha × *niliaca* Juss. ex Jacq. (64) Stockbridge House, Cawood; T. F. Medd.

Carduus acanthoides L. (63) Sowerby Bridge — introduced with soil, previously unknown in district; F. Murgatroyd.

Hieracium oistophyllum Pugsl. (64) Rocks near Colt Park wood; Mrs. Houseman.

H. subcrocatum (E. F. Linton) Roffey (64) Cray nr. Hubberholme; Mrs. Houseman.

Lemna gibba L. (63) Canal at Luddendenfoot, Halifax; F. Murgatroyd.

The following species are unrecorded in their respective grid squares in the Atlas.

44/07 *Thelypteris phegopteris* (L.) Sloss., *Ranunculus auricomus* L., *Chrysosplenium alternifolium* L., *Myosotis sylvatica* Hoffm., *Galium odoratum* (L.) Scop., *Adoxa moschatellina* L., *Solidago virgaurea* L., *Carex rostrata* Stokes and *C. curta* Good, all recorded by D. J. Tennant from How Stean Gorge, Stean Moor and Acorus Scar, Stean Beck, Nidderdale (64).

44/12 *Epilobium parviflorum* Schreb. (63) Sun Wood, Shelf nr. Halifax; D. Grant & T. Schofield.

NORTH RIDING: (C. M. Rob)

The outstanding discovery of the year was made by Mrs. Holloway, *Epipactis leptochila*, growing in two places on the banks of the river Swale near Richmond. The plant was noticed in 1965, and last July Dr. Young visited the two localities and confirmed the record. The plant grows in fairly deep shade on ground which is submerged when the river is in spate, a common occurrence in winter and as happened also on more than one occasion during the past summer. The localities are about one and a half miles apart, but are in different 10 km. squares. This species is generally southern in distribution with the exception of a doubtful record for V.C. 66, and up to the recent discovery has not been recorded north of Gloucestershire and Shropshire.

Mrs. Holloway also found *Sparganium minimum* near Brignal while prospecting for the Y.N.U. excursion.

Mr. Medd has recorded a number of species from the York district including *Aphanes microcarpa* which was also noted in V.C. 65 at the Y.N.U. meeting. The distribution of the two species in the county has not so far been worked out.

Mr. Simpson has done some good work in the Pickering district and confirms the persistence of *Carex pauciflora* in its old station near the source of the Derwent below Lilla Cross. *Paris quadrifolia* he records from seven new sites, *Convallaria* from two, and a most interesting list of additions to the 10 km. squares made Mr. Simpson's contribution a valuable addition to this year's report.

Gentiana pneumonanthe flowered late both at Stape and Strensall. At the latter place a few plants of *Drosera intermedia* were noted very near the Flaxton road in a popular picnic area which is being badly trampled by visitors. Several interesting plants were seen growing near the river Tees at Startforth opposite Barnard Castle. This river, like the Swale is given to sudden and violent flooding and some of the more shallow rooting species may not be able to survive for long. *Catabrosa aquatica* appeared to have been washed away soon after it was noted in mid-August. Both *Galium boreale* and *Plantago maritima* have been recorded from the Tees banks almost down to Croft near Darlington, occurring as wash-downs in the area subject to flooding.

Juniperus communis L. (62) Flainsey Rigg, near Dalby, 44/88; G. Simpson.
Trollius europaeus L. (62) Low Muffles, Wrelton, 44/79; G.S.
Helleborus viridis L. (65) Patrick Brompton, 44/29; Mrs. J. Holloway.
Ranunculus arvensis L. (62) Low Dalby, 44/88; G.S.
Ranunculus hederaceus L. (62) Lounsdale in Cleveland, 45/50; Y.N.U. meeting, Gt. Ayton.
Ranunculus trichophyllus Chaix (65) Woodale, Coverdale, 44/07; C.M.R.
Hornungia petraea (L.) Reichb. (65) Rocks near road on moor above Hardraw, Wensleydale, 34/89; W. A. Sledge. Confirmation of pre-1930 Atlas record.
Sagina ciliata Fr. (62) Sandhutton, York, 44/65; T. F. Medd.
Spergularia rubra (L.) J. & C. Presl (62) Middleton Moor, 44/79; G.S.
Aphanes microcarpa (Boiss. & Reut.) Rothm. (62) Buttercrambe Moor Wood; T.F.M. (65) Barningham; Y.N.U. meeting.
Saxifraga hirculus L. (65) Great Shunner Fell, 34/89; D. A. Ratcliffe. *Nat.* 136, 1967.
Drosera intermedia Hayne (62) Still at Strensall, 44/66; C.M.R.
Peplis portula L. (62) Field near railway, Pilmoor; C.M.R.
Epilobium adenocaulon Hausskn. (62) Sutton under Whitestonecliffe, 44/48; T.F.M. Catton, 44/37; C.M.R.
Myrrhis odorata (L.) Scop. (62) Crambeck, 44/76; T.F.M. Confirms pre-1930 record in Atlas.
Peucedanum ostruthium (L.) Koch (65) Lonton in Teesdale, 35/92; C.M.R.
Rumex longifolius DC. (65) Caldwell, 45/11; C.M.R.
Myosotis brevifolia C. E. Salmon (65) Baldersdale, 35/81; C.M.R.
Euphrasia borealis Wettst. (65) River bank, Startforth, 45/01; J.H. & C.M.R.
Mentha gentilis L. (65) River bank, Startforth, 45/01; J.H. & C.M.R.
Mentha piperita L. (65) Startforth, 45/01; J.H. & C.M.R.
Stachys × ambigua Sm. (62) Pilmoor; C.M.R.
Plantago maritima L. (65) Startforth, 45/01; J.H. & C.M.R.
**Epipactis leptochila* (Godfery) Godfery (65) Near river Swale, Easby, 44/19 and Richmond, 45/10; J.H.
Platanthera chlorantha (Custer) Reichb. (62) Red House Wood, Broxa, 44/99; G.S. (65) Woodale, Coverdale, 44/07; C.M.R.
Sparganium minimum Wallr. (65) near Brignall, 45/01; J.H.
Scirpus sylvaticus L. (65) Startforth, 45/01; J.H. & C.M.R.
Eleocharis multicaulis (Sm.) Sm. (62) Blea Hill Beck, 45/80, and upper Derwent, 44/89; G.S.
Schoenus nigricans L. (62) Stockland Beck, 44/99; G.S.
Calamagrostis epigejos (L.) Roth (65) Camphill Wood, Kirklington, 44/38; Lady Ropner comm. C.M.R.

ALIENS AND CASUALS: (Mrs. F. Houseman)

More records of established alien plants have been sent in this year. Wool aliens are scarce now due chiefly to new regulations regarding tipping of wool waste. It is clear that *Epilobium nerterioides* and *Veronica filiformis* are increasing rapidly as more records are received each year.

The following have kindly sent records:— G. Beaumont, F. E. Branson, Mrs. Burdon, E. Chicken, Miss E. Crackles, Mrs. J. E. Duncan, C. Hartley, I. C. Lawrence, Miss H. Lefevre, T. F. Medd, F. Murgatroyd, J. Oxtoby, Miss C. M. Rob, Lady Ropner, G. A. Shaw, R. E. B. Taylor, E. Thompson, Miss D. Walker.

Mahonia aquifolium (Pursh) Nutt. (62) East Ayton; T.F.M.
Rapistrum perenne (L.) All. (62) Railway bank, Warrenby; J.C.L.
Geranium macrorrhizum L. (64) Yorks. side of R. Hodder; F.H.
Acer platanoides L. (64) Healaugh; T.F.M.
Trigonella polycerata L. and *T. caerulea* (L.) Ser. (det. J.E.L.) (63) Mirfield; R.E.B.T.
Medicago sativa L. and *M. arabica* (L.) Huds. (61) Germany Lane, Fulford, York.
Melilotus indica (L.) All. (63) Mirfield; R.E.B.T.
Coronilla varia L. (61) Driffield; Miss Taylor and Mr. Rushton.
Galega officinalis L. (61) In quantity, roadside, Ferriby; E.Ch.
Vicia vestita Boiss. (64) Baildon; F.B.
V. narbonensis L. (det. J.E.L.) (63) Mirfield; R.E.B.T.
Rubus spectabilis Pursh (61) Risby; E.C.
Prunus cerasifera Ehrh. (62) Hedge, East Ayton; T.F.M.

Tolmeica menziesii (Pursh) Torr. & Gray (61) Rampart, Bilton Beck, Harrogate; F.E.B. and G.A.S.

Saxifraga hirsuta L. (63) Crownest wood, Hebden Bridge; F.M.

Epilobium nerterioides Cunn. (64) Acorus scar, Stean Beck; D. J. Tennant. Cautley Spout; F.H. (65) Colsterdale; Y.N.U. Bryol. meeting.

Polygonum cuspidatum Sieb. & Zucc. (62) Langton on Swale; C.M.R. Near Hardraw, Wensleydale; C.M.R.

P. equisetiforme Sibth. & Sm. (det. J.E.L.) (64) Baildon; F.H.

Castanea sativa Miller (62) Roadside, Sand Hutton, York; T.F.M.

Calystegia pulchra Brummitt (64) Collingham; F.H.

Datura stramonium L. (65) Scruton; C.M.R.

Hyoscyamus niger L. (63) Mirfield; R.E.B.T.

Verbascum virgatum Stokes (63) Mirfield; R.E.B.T.

V. nigrum L. (61) Lowthorpe; E.Ch. (65) Jervaulx Abbey; J.H.

Cymbalaria pallida (Ten.) Wettet. (64) Pateley Bridge; C.M.R.

Veronica filiformis Sm. (61) Sunk Island; Mrs. Thistleton per E.C. Lawnweed, Hull and Hornsea; E.C. (64) Meadow near Horton-in-Ribblesdale; Y.N.U. Excn. Harrogate Stray, Harlow Hill area and Ripley Park; D.W. Near Litton; J.E.D. (65) Grassfield, east end of Leyburn Shawl; C.M.R. and D.W.

Campanula persicifolia L. (64) Wood near Mickley; C.M.R.

Physocarpus opulifolius Max. (65) Barningham; Y.N.U. Excn.

Cephalaria elata Hornem. (65) Roadside near Baldersby; C.M.R.

Galinsoga ciliata (Raf.) Blake (63) Chickenly nr. Mirfield; C.H. (65) Garden weed, Camphill, Kirklington; Lady Ropner.

G. parviflora Cav. (61) Riccall; Miss Taylor and Mr. Rushton (64) Garden weed, York; T.F.M.

Senecio squalidus L. (64) Knaresborough; J.O. Crossgates station nr. Leeds and about loco. sheds Leeman Road, York; G.A.S.

Onopordum acanthium L. (61) Sands Wood near Wintringham: E.Ch.

Centaurea diluta Ait. (62) Topcliffe; C.M.R.

C. cyanus L. (64) Several plants in a meadow at Dacre Banks, Nidderdale; J. Grace per E.T.

Helianthus rigidus (Cass.) Desf. (64) Beanlands Island, Ilkley; J.E.D.

Cicerbita macrophylla (Willd.) Wallr. (62) Lastingham: C.M.R. (64) Yorks. side of Hodder, Dolford Bridge: F.M.

Lilium martagon L. and *L. pyrenaicum* Gouan (65) Barningham: Y.N.U. Excn.

Tulipa sylvestris L. (61) South Cave; Mr. Cutts per E.C.

Ornithogalum nutans L. (65) Field near Hauxwell; Mrs. Burdon per C.M.R.

Juncus tenuis Willd. (63) Railway bank, Brighouse; Messrs. Grant & Schofield (64) Harrogate Road to Kex Beck; G.A.S.

Scirpus nodosus Rottb. (det. J.E.L.) (64) Baildon; F.H.

Lolium temulentum L., *Panicum miliaceum* L. and *Setaria italica* (L.) Beauv. (62) Topcliffe tip; C.M.R.

Hordeum jubatum L. (61) Germany Lane, Fulford, York; T.F.M. (62) Reseeded field, riverside, Clifton, York; T.F.M.

Poa chaixii Vill. (64) Askham Richard churchyard; C.M.R.

BRYOLOGY

This has been a very good bryophyte year and again many interesting records have been made and many new locations discovered for the commoner species. Two field meetings have been held. The visit to Birk Gill, Colsterdale, V.C. 65, has been reported fully in *The Naturalist.* The recent field meeting, 2nd to 9th September, held jointly with the B.B.S. at Northallerton with the object of recording bryophytes from little worked areas of V.C. 62 and confirming a number of old records, was most successful but is not reported here as much work still remains to be done on the material collected. It will be included in next year's report. Two of us also attended the Botanical Section's excursion to Richmond on 21st May, and this also proved a rich area for bryophytes — both *Isothecium myurum* and *Anomodon viticulosus* were abundant. During the year twelve new V.C. records for mosses and four for hepatics have been made. The Bryological Section will in future visit each of the five Yorkshire Vice-Counties in turn.

HEPATICAE (F. E. Branson): *A deletion*: On 24th September 1897, William Ingham of York, gathered a *Scapania* from Jackdaw Crag Quarry near Tadcaster, V.C. 64, which both he and Mr. MacVicar named a 'curious form of *Scapania aequiloba*'. Later they both thought it quite likely to be *Scapania calcicola*, new to Britain. Mr. Ingham sent a specimen to Dr. Arnell of Uppsala, Sweden, the author of an article on the species, who confirmed this opinion, and there is an article in *The Naturalist* 1904, 11–12 by William Ingham entitled '*Scapania calcicola*: a new British Hepatic'. Mr. A. R. Perry of Oxford University has recently examined this packet from the Ingham Herbarium and replies:— 'it is unfortunately not *S. calcicola* as Arnell first thought, and I have identified it as *S. aequiloba*.' This record has now been deleted from the Y.N.U. Hepatic record book. The only known location for this plant in the British Isles is in V.C. 88 (mid-Perth).

The following list includes the more interesting records for the past year.

* denotes new vice-county records, † new county record.

Anthoceros laevis L. (64) Bramham Park, 25th Sept. 1967; G.A.S. Confirmation of 1951 record of L. I. Scott & H. Walsh.

Preissia quadrata (Scop.) Nees (64) Studley Park, 2nd July 1967; F.E.B.

Ricciocarpus natans (L.) Corda (63) Ponds at Thorne, 28th Sept. 1967; G.A.S. Confirmation of a record of Dr. J. M. Taylor made some twenty years ago. (*65) Pond near Fatten Hill Plantation, Ellerton Hill, 22nd March 1967; Miss D. R. Walker & Mrs. Haythornthwaite.

Riccardia sinuata (Dicks.) Trev. (64) Near S. Stainley, 23rd Oct. 1966; F.E.B.

R. pinguis (L.) Gray (61) Wharram quarry, Malton, 20th Nov. 1966; F.E.B. & M.D. (65) Birk Gill, Colsterdale, fine male plants and female plants, 15th April 1967; F.E.B.

**Pellia neesiana* (Gottsche) Limpr. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.

Metzgeria furcata (L.) Dum. (61) Cansdale, near Filey, 23rd Oct. 1966; M.D. (64) Jackdaw Crag quarry, Tadcaster, 22nd Jan. 1967; F.E.B.

M. fruticulosa (Dicks.) Evans. (65) Barningham Park Wood, July 1967; M.D.

M. pubescens (Schrank) Raddi (65) Downholme, Richmond, 21st May 1967; F.E.B. & M.D.

Blasia pusilla L. (64) Bramham Park, 25th Sept. 1967; G.A.S. Confirmation of record made by L. I. Scott in Oct. 1929. (65) Birk Gill, Colsterdale, 15th April 1967; G.A.S. & F.E.B.

Trichocolea tomentella (Ehrh.) Dum. (65) Birk Gill, Colsterdale, 15/4/67; F.E.B.

Calypogeia trichomanis (L.) Corda emend. Buch (64) Scotton Banks Knaresborough, 5th February 1967; F.E.B. (*65) Cleve Beck near bridge from Brough to Middleton-in-Teesdale, 9th July 1967; M. Gow.

Leiocolea badensis (Gottsche) Jörg. (64) Jackdaw Crag quarry, Tadcaster, 22nd Jan. 1967; F.E.B.

Solenostoma sphaerocarpum (Hook.) Steph. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.

Plectocolea obovata (Nees) Mitt. (65) Birk Gill, Colsterdale, 15th April 1967; F.E.B.

Chiloscyphus pallescens (Ehrh.) Dum. (65) Birk Gill, Colsterdale, 15/4/67; F.E.B.

†*Cephaloziella stellulifera* (Spruce) Schiffn. (64) Riffa Wood, Pool-in-Wharfedale, 7th Feb. 1967; M.D.

Nowellia curvifolia (Dicks.) Mitt. (64) Ling Gill, Ribblehead, 29th May 1967; M. Gow. (65) Birk Gill, Colsterdale, 15th April 1967; M.D.

Scapania umbrosa (Schrad.) Dum. (65) Brignall Banks, 8th July 1967; M.D.

Porella cordaeana (Hub.) Evans (64) Between Birkham Wood and Low Bridge, Knaresborough, 9/10/66; Scotton Banks, Knaresborough, 14/5/67; F.E.B.

Lejeunea cavifolia (Ehrh.) Lindb. (64) Ling Gill, Ribblehead, June 1967; F.E.B.

Cololejeunea calcarea (Lib.) Schiffn. (64) Ling Gill, Ribbleshead, 29/5/67; M. Gow.

Frullania tamarisci (L.) Dum. (65) Brignall Banks, 8th July 1967; M.D.

F. dilatata (L.) Dum. (61) Primrose Valley, Filey, 24th Oct. 1966; M.D. (65) Brignall Banks, 8th July 1967; F.E.B.

Nomenclature follows the *Census Catalogue of British Hepatics*, J. A. Paton, 1965.

MUSCI: (M. Dalby):

**Fissidens minutulus var tenuifolius* (Boul.) Norkett. (64) Jackdaw Crag, Jan. 1967; F.E.B. & M.D. Bilton Banks, Mar. 1967; F.E.B. & G.A.S.

Seligeria acutifolia var longiseta Lindb. (64) Hartlington Gill, Oct. 1966; G.A.S.

S. paucifolia (Dicks.) Carruth. (61) Huggate chalk quarry, Aug. 1967; J.R.

S. calcarea (Hedw.) B., S. & G. (61) Huggate chalk quarry, Aug. 1967; J.R.
**Blindia acuta var arenacea* Mol. (65) Birk Gill, Colsterdale, Apr. 1967; F.E.B.
Dicranella subulata (Hedw.) Schimp. (65) Birk Gill, Colsterdale, Apr. 1967; G.A.S.
Dicranum strictum Schleich ex Schwaegr. (64) Middleton Woods, Ilkley, Jan. 1967; M.D. Bilton Banks, Mar. 1967; G.A.S. Eavestone Lake, May 1967; M.D.
**Campylopus introflexus* (Hedw.) Brid. (65) Scugdale spoil heap, Aug. 1967; B.O'S.
Aloina brevirostris (Hook. & Grev.) Kindb. (64) Burton Leonard, Nov. 1966; F.E.B.
A. rigida (Hedw.) Limpr. (64) Burton Leonard, Nov. 1966; F.E.B.
Pottia davalliana (Sm.) C. Jens. (61) Wharram quarry, Nov. 1966; F.E.B. & M.D.
Gymnostomum calcareum Nees & Hornsch. (64) Near South Stainley, Oct. 1966; G.A.S. & F.E.B. Ling Gill, Ribblehead, June 1967; M.G. excn. Y.N.U. Loup Scar, Burnsall, June 1967; M.D. *(65) Downholme, Richmond, May 1967; F.E.B. & M.D.
Gyroweissia tenuis (Hedw.) Schimp. (64) Scotton Banks, Feb. 1967; F.E.B.
Splachnum ampullaceum Hedw. (64) Denton Moor, Ilkley, Jan. 1967; M.D.
**Pohlia rothii* (Correns) Broth. (64) Lindley Reservoir wood, Dec. 1966; M.D.
**Bryum rubens* Mitt. (62) Catton, Jan. 1951; J. Appleyard.
Philonotis fontana var adpressa (Ferg.) Limpr. (65) Birk Gill, Colsterdale, Apr. 1967; F.E.B. excn. Y.N.U.
Orthotrichum cupulatum var nudum (Dicks.) Braithw. (65) Downholme, Richmond, May 1967; F.E.B. & M.D.
O. affine Brid. (64) Scotton Banks, May 1967; F.E.B.
O. rivulare Turn. (65) Brignall Banks, R. Greta, July 1967; M.G. excn. Y.N.U.
**Fontinalis squamosa* Hedw. (62) Eskdale, near Castleton, Aug. 1967; B.O'S.
**Thuidium philibertii* Limpr. (61) Huggate chalk quarry, June 1967; J.R. excn. Y.N.U.
Hygroamblystegium tenax (Hedw.) Jenn. (64) Winksley, July 1967; F.E.B.
H. fluviatile (Hedw.) Loeske (64) Scotton Banks, May 1967; F.E.B.
Amblystegium kochii B., S. & G. (64) Copgrove, May 1965; G.A.S. & F.E.B.
Brachythecium salebrosum (Web. & Mohr.) B., S. & G. *(61) Huggate, June 1967; F.E.B. excn. Y.N.U. (64) Studley Park, July 1967; F.E.B.
Orthothecium intricatum (Hartm.) B., S. & G. (64) Hartlington Gill, Oct. 1966; G.A.S.
**Plagiothecium latebricola* B., S. & G. (65) Brignall Banks, R. Greta, July 1967; M.D. excn. Y.N.U.
**P. denticulatum var obtusifolium* (Turn.) Paris (65) Millbeck Wood, Teesdale, Aug. 1964; G.G.
**P. curvifolium* Schlieph ex Limpr. (65) High Force, Teesdale, Aug. 1964; G.G.
†*P. laetum* B., S. & G. (65) Brignall Banks, R. Greta, July 1967; M.D. excn. Y.N.U.
Hylocomium brevirostre (Brid.) B., S. & G. (65) Birk Gill, Colsterdale, Apr. 1967; F.E.B. excn. Y.N.U.

Nomenclature follows E. F. Warburg, *Census Catalogue of British Mosses* 3rd edition, 1963. My thanks are due to Messrs. F. E. Branson, G. A. Shaw, B. O'Shea, Rev. G. G. Graham, Dr. M. Gow and Miss J. Robertson for the above records.

Key to the Families of Flowering Plants of the World by **J. Hutchinson.** Pp. 117 with 6 figures. Clarendon Press: Oxford University Press. 1967. Paperback 18/-, Hardback 30/-.

Dr. Hutchinson's two volume work on the *Families of Flowering Plants* included an artificial key to the families. Practical use over many years inevitably reveals snags and unworkable — or at least unsatisfactory — parts in such a compilation and the present work represents a revised and rearranged key by which it is now 'Confidently expected that the family of a very large percentage of flowering plants, wild or cultivated in any part of the world, may be ascertained'. Four hundred families are included and whilst the arrangement is substantially similar to that of the earlier key it may be assumed that both the improvements incorporated in the contrasting clauses of the key and the increase in the number of families through subdivision, which makes for more accurate delimination of groups, will both facilitate identifications. The problem of the 'untypical' genus is covered as far as possible by many families receiving several entries in the key. A short glossary and a few diagrammatic illustrations have been added.

This is a book which not only University libraries and institutions which have any concern for taxonomic botany should possess, but one which will be of interest and use to all systematic botanists whose horizons are not narrowly limited. W.A.S.

THE NATIONAL BADGER SURVEY

Many readers will probably already be familiar with the British Mammal Society's National Badger survey, which is being conducted county by county throughout the country. My predecessor Mr. G. Teasdill, was county recorder for the whole of Yorkshire, but since I became recorder in June, 1967 I have limited myself to the West Riding only, and have persuaded a friend, Mr. Adrian Middleton of Lund, Driffield, to record in the East Riding. As yet there is no recorder for the North Riding.

The aim of the survey is to record details such as site and size of sett, soil, vegetation, etc., with accurate grid reference, with a view to scientific analysis in the hope of further understanding the badger and its distribution. Some counties are well under way; in Somerset for example over 1,200 setts are recorded. Before taking on the West Riding I had the pleasure of helping with Nottinghamshire and we have 56 setts recorded in the county; the number so far recorded in the West Riding is 76 and this is climbing slowly every week. Most of the setts recorded are in one of three groups, which reflect the activity of local recorders rather than the true distribution of the badger. The biggest number of setts recorded is in the southern parishes of the county in the sector bounded by Sheffield, Rotherham and Doncaster and Mr. Reg Bramhill of Rotherham Naturalists has been most helpful here; another nucleus is around the parishes south of Huddersfield and Mirfield (thanks to Norman Handley) and west of Barnsley. I have, as yet, no records of setts further north than Huddersfield.

The setts are very varied in type and we have records from clay, sand, limestone, millstone grit and shale; in deciduous woods, conifer plantations, hedgerows, open fields, river banks, quarries and old mine workings. Most are smaller than the ones known to me in the Cotswolds. The proximity to human life is surprisingly close at some setts on the edges of our large towns and I had the pleasure of watching one in Sheffield in the summer when badgers emerged whilst nearby gardeners tended their bonfires! One of the lowest lying setts in the country only ten feet above sea level, is on Hatfield Moors and this is in peaty soil.

There must be many setts known to individual naturalists in the county not officially recorded and I would be pleased to hear from people; also I would be pleased to hear from anyone willing to act as a local recorder in the north of the county.

May I express my thanks to other helpers not previously mentioned, Bill Stoney, David Holmes, Charles Waite; to land owners, farmers and keepers who have given help by allowing access to the setts on their land.

RICHARD J. PAGET, 13 *The Baulk, Worksop, Notts.*

CANADA GEESE BREEDING AT FAIRBURN INGS NATURE RESERVE

In July, 1966, three wing-clipped juvenile Canada Geese from the Swinton Park stock were released at Fairburn Ings Nature Reserve. At about the same time a bird with an injured (probably broken) wing arrived at the western (Ledston) end of the reserve, and finally made its way to, and settled at Newton where it soon attracted a second bird which stayed with it.

During the spring of 1967, Canada Geese occurred on the reserve more regularly and in larger numbers than usual, mainly at Newton, a dozen or more frequently feeding in the fields by Newton Abbey during April. We believe that they were attracted by the wing-clipped introduced birds and the one with a broken(?) wing. Although there was less evidence of adult free-flying birds during May, on 1st June, 1967 we saw a pair of Canada Geese with five recently hatched goslings. This was the first instance of breeding which either of us had known in over fifteen years' knowledge of the area, during which, (apart from 38 on 28th Sept., 1958) we have classified the species as an 'irregular visitor in small numbers'; hence it seemed worthwhile looking at past records.

In the twenties and thirties, when mining subsidence was beginning to induce the present permanent marshland, flocks of 150 were not infrequently seen (*The Naturalist* 225, 1938), but W. G. Bramley who lived at Fairburn from 1919 to 1928 had no record of Canada Geese breeding there during that period nor up to 1938. He had recorded them during the breeding season only in 1921 when 2 birds were present in May. In 1938, however, R. Chislett reported a pair with five young. This appears to be the only previous record of Canada Geese breeding at Fairburn.

C. WINN AND R. F. DICKENS

THE YORKSHIRE

PROFIT AND LOSS ACCOUNT

EXPENDITURE

1966 £ s. d.		£ s. d.	£ s. d.
	GENERAL PRINTING:		
32 4 0	Members' Cards	32 10 0	
74 19 1	Circulars	84 15 3	
– – –	List of Members	72 15 0	
107 3 1			190 0 3
	The Naturalist:		
	Cash Paid	753 6 6	
	Editor's Expenses	4 0 0	
		757 6 6	
582 5 6	*Less* Sales to non-members	149 10 0	
			607 16 6
	Extra Pages and Illustrations	67 5 0	
26 15 0	*Less* Received from Y.N.Trust	16 0 0	
			51 5 0
	SUNDRY EXPENSES:		
32 9 3	Officers' Expenses	41 12 2	
15 6 6	Duplicating and Stationery	19 18 1	
15 13 6	Bank Charges	8 14 9	
12 10 0	Subs. and Donations paid	3 2 0	
19 4 9	Cost of News Letters	35 10 9	
10 0 0	Spraying Symposium	– – –	
			108 17 9
59 9 7	Profit		29 6 7
£880 17 2			£987 6 1

BALANCE SHEET as

£ s. d.		£ s. d.	£ s. d.
	ACCUMULATED FUNDS — GENERAL		
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Chislett Legacy	500 0 0	
1050 0 0			1050 0 0
	MYCOLOGICAL FUND:		
	Balance brought forward	132 13 11	
	Cash received and in transit	15 1 10	
132 13 11			147 15 9
1147 6 0	ORNITHOLOGICAL FUND — Capital		1147 6 0
	Revenue:		
	Balance brought forward	54 4 0	
	Interest on Investments	66 0 0	
		120 4 0	
54 4 0	*Less* Expended	9 1 11	
			111 2 1
	LIFE MEMBERS' ACCOUNT:		
	Balance brought forward	117 15 0	
	Cash received	20 0 0	
		137 15 0	
117 15 0	*Less* Transfer subscriptions	15 0 0	
			122 15 0
	SUNDRY CREDITORS:		
76 9 0	Subscriptions paid in advance		24 15 0
	PROFIT AND LOSS ACCOUNT:		
	Balance brought forward	719 9 7	
	Add Profit	29 6 7	
719 9 7			748 16 2
£3297 17 6			£3352 10 0

AUDITORS' REPORT

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
Chartered Accountants,
4–6 Harrison Road,
Halifax.

31st December, 1967.

NATURALISTS' UNION

Year to 30th September, 1967

INCOME

1966 £ s. d.			£ s. d.
708 14 9	Subscriptions and Donations		734 13 1
21 4 4	Interest on Dividends		84 4 9
20 7 1	Bank Interest		19 4 9
109 3 10	Income Tax on Covenants		141 5 5
21 7 2	Sale of Publications		7 18 1
	Chislett Memorial Fund:		
	Balance brought forward	279 18 5	
	Interest received	12 4 8	
		292 3 1	
	Less Cost of Second Lecture	20 5 6	
	Balance in Westminster Bank	271 17 7	
£880 17 2			£987 6 1

at 30th September, 1967

£ s. d.		£ s. d.	£ s. d.	£ s. d.
	Investments (at cost):			
	Ornithological Account:			
	Nicholas Fund: 3% Brit. Transport	100 0 0		
	Chislett Legacy:			
	£600 5½% Treas. Stk.	545 9 0		
	£600 5% Treas. Stk.	541 17 0		
1147 6 0			1147 6 0	
	General Account:			
	Booth Fund 3½% Conversion Stock	100 0 0		
	Cheesman 3½% War Stock	100 0 0		
	4% Consols (Bank of England)	200 0 0		
	4% Consols (Post Office)	159 10 11		
	300 Unilever Ordinary Shares	522 1 6		
	250 Shell Trans. Ord. Shares	511 7 0		
1592 19 5			1592 19 5	
2740 5 5			2740 5 5	
235 0 0	*Less* Reserve for Depreciation		235 0 0	
2505 5 5				2505 5 5
	Bank Accounts:			
403 16 3	York County Savings Bank		422 13 0	
16 2 0	*Add* Interest accrued		16 10 0	
419 18 2			439 3 0	
192 19 6	Westminster Bank Current A/c.		168 19 6	
612 17 9				608 2 6
	Sundry Debtors:			
	Subscriptions unpaid	8 0 0		
	Less Reserve Bad Debts	5 0 0		
			3 0 0	
	Income Tax Repayable:			
	Dividends		24 0 3	
	Cash in transit		212 1 10	
179 14 4				239 2 1
£3297 17 6				£3352 10 0

CORRESPONDENCE

Dear Sir,

Races and plumages of Guillemots

In reply to Dr. Bourne's letter on my short paper on 'Northern Guillemots in Yorkshire Waters', I would make it quite clear that I was fully aware of the existence of the races *hyperborea* and *spiloptera*, but where does that get us?

I aimed my comments at the ordinary field worker, not the dedicated taxonomist. If people were to do more than put a desultory boot under a corpse and simply pronounce it 'dead', then the requested task had to be a simple one. As most of the corpses are either oiled or rotting or both, the most one could expect was the broad division of 'grey backed' Southern and 'black-backed' Northern. To have complicated the matter with other obscure races would have been ridiculous. Let us learn to walk before we attempt to run!

Those specimens which are sent to me for preservation are of course examined in order to determine their race more exactly. This of course can only be done in the laboratory with others for comparison and the man on the beach has no part to play in this, beyond sending the specimens in.

I must draw attention to an error in Dr. Bourne's second paragraph, line two. For 'later' read 'earlier'. Despite the remarks on moult in this same paragraph, the ones with delayed moult which I illustrated were 'black-backed' and therefore Northerns, and in any case there is no argument on this point, as his remarks confirm mine if one reads carefully.

The remarks about flank markings in paragraph three are also without foundation. It is a plain fact that Northerns have their flanks streaked blackish in varying degrees according to age and that Southerns have theirs streaked greyish to a lesser degree, especially in first year examples, when it is almost negligible. To suggest that the bird illustrated in my paper is an 'individual variation' is not valid. This example is not an exception; it is typical of many I have inspected. The remarks in paragraph four are mainly taxonomic and therefore not relevant to my paper. The discerning reader will learn to apply my criteria most effectively with a little practise and be able to separate *U. a. aalge* from *albionis* under field conditions.

It is perhaps a pity that Dr. Bourne added his last, strange paragraph. I would like to take this opportunity of thanking all those who have sent specimens for preservation, and those who have taken details of birds found and reported them.

JOHN R. MATHER

Dear Sir,

Empty bottles and small mammals

I was pleased to read Mr. C. G. Booth's timely note (*The Naturalist*, 1967: 80) about the danger caused to birds by discarded lengths of nylon fishing line.

Perhaps I might draw attention to another countryside hazard — the empty bottle thrown down at the wayside. If it lodges with even the slightest tilt towards the bottom end, it forms a death-trap to all manner of small creatures that enter but cannot climb out again up the slippery sides. An acquaintance has found the remains of twenty-eight small mammals in one such death-trap, and I have myself found old bottles half filled with bones and fur.

I suggest that we, as countrygoers, should 'immobilise' such dangerously-placed bottles when we come across them, and also should publicise our concern at the suffering they cause. Such action might even perhaps hasten the eventual discontinuance of glass — always a dangerous substance — in bottle manufacture.

K. G. SPENCER

Late Egg of House Sparrow

On Thursday, 26th October, a newly laid egg of House Sparrow was found on a trough of plants in my garden at Bradshaw near Bolton, Lancs. Pigmentation was virtually nil. Weather was exceptionally mild, bright and sunny.

ELLEN HAZELWOOD

BOOK REVIEWS

Pesticides and Pollution by **Kenneth Mellanby.** Pp. 221 with 14 plates, 2 in colour, and 8 text figures, *New Naturalist* series, Vol. 50. Collins. 30/–.

This book is essentially an account of the way in which man is unintentionally contaminating his environment. Pollution, including radiation, has developed as a side effect of the increase in human population and increased material productivity; while pest control has provided a different problem by reason of its unintended effects on other organisms.

Dr. Mellanby, Director of the Nature Conservancy's Monks Wood Experimental Station, writes as a dispassionate scientist in an attempt to assess the damage that has already been done, and the current threats to the natural heritage of man in this country. At the mention of the word 'pesticides' most naturalists recall the tremendous impact which Rachel Carson's book made on government departments and other policy-making groups; but Dr. Mellanby has deliberately avoided dealing with *Silent Spring* because he thinks 'the time has come to try to look at all sides of the problem'. A first reading of *Pesticides and Pollution* may give the impression that its author has been less helpful to the cause of the naturalist than one might hope, but second thoughts confirm the fact that he has treated his subject in a thoroughly scientific manner and has provided the naturalist with a reliable source of information.

Progress in the expanding economy of Britain is, however, not always regulated by calm, objective recommendations of scientists such as Dr. Mellanby, but by pressure groups often representing extreme opinions and not infrequently motivated by financial considerations. The naturalist, the politician and the industrialist can all be regarded as inflexible and uncompromising according to one's point of view. But all participants in any future controversy, whether it be another Teesdale or a new system of insecticides, will have Dr. Mellanby's cogent summary as a factual and unbiased guide.

The fact that *Pesticides and Pollution* is the 50th volume in the *New Naturalist* series calls for special mention. Over the last 25 years, Collins have provided the naturalist with books covering the whole spectrum of his interests, and there can have been few publishing ventures which have so successfully met the needs of a minority group. It is inevitable but regrettable that 15 years ago books in this series contained ten times as many colour plates, twice as many monochrome plates, a greater wealth of text figures and yet were only half the price. Nevertheless, the publishers are to be congratulated on a remarkably fine achievement, and deserve every success and encouragement in the production of the next fifty volumes. C.J.S.

Tracks by **E. A. R. Ennion and N. Tinbergen.** Pp. 63, with 122 photographs, drawings and combinations of both. Clarendon Press: Oxford University Press. 1967. 25/-.

The talents of two eminent naturalists have combined in this work to give us an original, imaginative, informative and often amusing slant on a well-used topic. Tracks can be fascinating or frustrating, depending on the degree of success which you have in contacting the animals which leave them. However, in this book the fine photographs by Professor Tinbergen, interpreted and embellished by Dr. Ennion's spirited drawings, capture the imagination and give greater meaning to the subject of tracks as indicators or reminders of the daily or nightly activities of animals — in this case ranging from insects to mammals. The pictures of Natterjack Toad and Adder tracks are truly remarkable. Feeding, fighting, playing, life and death, are all recorded or reconstructed here from traces in mud, sand and snow. This is a book well worth having or for giving as a present to any naturalist or country lover. T.M.C.

British Turtles by **L. D. Brongersma.** Pp. 23 with 19 text figures. Publication No. 659 of the British Museum (Natural History). Eyre and Spottiswoode. 1967. 2/6.

This is the authoritative guide to the five species of marine turtles which have occurred on the coasts of Britain. Dr. Brongersma, Director of the Leiden Museum, has in this publication brought up-to-date the earlier section of the 'Stranded Whales and Turtles Guide' and has added some extra material. As is usual with Natural History Museum publications this one is good value for money and should be in the hands of everybody who may, by chance, find themselves face to face with a stranded turtle, and with 61 records between 1950 and 1966, this could mean anybody.

T.M.C.

A Field Guide to the Mammals of Great Britain and Europe by **F. H. Van Den Brink.** Pp. 221 with 20 coloured plates and 12 black and white plates. Collins, 1967. 30/-.

At last, after being available only in various European languages since 1955, an English edition of this work has appeared. All the 231 species which occur west of longitude 30° E. are described and illustrated. This book is the natural rucksack or pocket companion for the famous *Field Guide to European Birds* and is prepared along the same lines, using the Peterson system of field identification.

F. H. Van Den Brink has done a fine job in treating the mammals of Europe in field guide form even to the distribution maps. The latter, naturally, have a few gaps and omissions, but these are more of a spur to those who will plot changes in distribution in future editions than a detrimental feature; the impetus given to mammal study by a book of this type will see to that. As more and more British naturalists travel in Europe they will no doubt have cause to thank the author and the translators and editors, Hans Kruuk and H. N. Southern, for putting this book into their hands. No less will they thank Paul Barruel whose excellent paintings put life into illustrations which are so much more than mere pelage maps.

The book is as essential to the travelling naturalist as his passport and his Peterson! For the stay-at-home mammalogist it is a guide to British mammals as well as a book to browse in. T.M.C.

Mammals of Britain — Their Tracks, Trails and Signs by **M. J. Lawrence** and **R. W. Brown**. Pp. 223 with 32 coloured photographs and over 250 black and white photographs and line drawings. Blandford. 30/–.

The recent upsurge of mammal books is still new enough to be gratifying and this one will find a place on many bookshelves. It does not set out to teach one mammal identification from the whole animal, but contains a wealth of information on tracks, signs and remains which will prove very useful to many mammal students. Under the headings of occurrence, habits, habitats, tracks, trails, signs and dwelling place, with terms used for male, female and young if significant, each species is treated and there are keys and copious diagrams for the identification of remains from owl pellets. The authors claim that it is based almost entirely on their own fieldwork and this gives one confidence in it but, at the same time, a little more checking with literature would have helped, particularly with the distribution maps. The map for the mole gives areas of great abundance and those for which no information is available — the latter includes so much of Britain that the map is of very little value. Similarly, northern England appears to be devoid of Mink. However, it is a book which most of us will turn to from time to time when a footprint or a dropping gives us trouble and thus it can be recommended widely to both naturalists and people with general countryside interests.

The book is not dated, unfortunately, and in my copy a number of pages were not bound in. Apart from this the production is excellent. The colour photographs, by Geoffrey Kinns, are a pleasing gallery of mammal portraits. T.M.C.

Wild Life of the South Seas by **F. A. Roedelberger and Vera I. Groschoff.** (English version by Peter J. Whitehead). Pp. 216 with 250 photographs in colour and black and white by 60 photographers. Constable. 1967. 45/-.

This is the latest volume in a series which has looked at the wild life of large slices of the earth's surface and it is a superb pictorial review of the South Seas. The faunas of the Indo-Pacific, Indonesia, Australia, Oceania and the Galapagos Islands contain such a wealth of riches that starting on the task of discussing and illustrating them might be daunting. However, the authors and the photographers whose work is shown give a coverage which should suit everybody. The whole page colour photographs contain some classics and the black and whites often form series with enormous punch. The egg, nest and young series of the Crested Tree Swift, the set of Komodo Dragon pictures, the action shots of Koala Bear and indeed every picture in this work, whether taken in the museum or the wild — all are excellent. The list of photographers contains many names familiar to British readers, such as Des Bartlett, Jane Burton, Sven Gillsaeter, Heinz Siehlmann, John Warham, Cy La Tour, Loke Wan Tho, John Markham and a host of others. The text is clear and concise and makes a worthy complement to the pictures. A book which will be widely enjoyed. T.M.C.

The Birds of the Doncaster District by **R. J. Rhodes.** Pp. 101 with fold-in map. Published by the Doncaster and District Ornithological Society (1967) and obtainable from R. D. Mitchell, 125 Chequer Avenue, Belle Vue, Doncaster. 10/6 post free.

For the purposes of this book, the Doncaster district is not a geographically discrete one, but an arbitrary area enclosed by a circle of 10 miles radius from the centre of the borough, and including parts of Lincolnshire and Nottinghamshire. The main geological divisions within this circle and its wide variety of habitats are detailed. The comparatively recent changes in the latter, together with consequent effects on bird-life, are fully discussed. The fen, carr and marshland areas to the east are possibly the most interesting in that they show the greatest changes and have become regarded as the most typical of the Doncaster habitats. Clearly the writing of these sections has involved the author in a great depth of research — research which has not been confined solely to ornithological literature.

The main bulk of the book, 75 pages, is taken up by a classified list. The status of each species (based on occurrences this century) is given. In the subsequent information all traced records from the previous hundred year's literature are also included. Hence we learn, for instance, that Bittern, harriers, Black-tailed Godwit, Ruff, Crossbill, etc. formerly bred. Obviously the author will have had reservations about some of the old records of rarities (e.g. the undated Chough mentioned by Allis in 1844) and probably about some of those which he has included because they appeared in Y.N.U. Annual Ornithological Reports between eight and twenty-five years ago but which would have been unlikely to pass through the sieve of both the present Y.N.U. Records Committee and the B.B. Rarities Committee. There may be occasion, sometime, for a further reappraisal of some of these. This the author has already done for a 1958 Long-tailed Duck which still stands in the Y.N.U. Annual Ornithological Report for that year.

The well-documented records of the past two decades have been thoroughly sorted and are presented in a concisely written but easily readable form. (Insufficient precision in the writing of the comments on Wood Sandpiper is an exception.)

With typical modesty, Mr. Rhodes does not claim his own personal reponsibility for quite a proportion of the observations. These will be recognised by those who have studied county reports over the past twenty years. There is no need for him to advance any claims as far as this present book is concerned. *The Birds of the Doncaster District* is an excellent volume on which his stamp is clearly marked. Of its kind it is an absolute model.

For its size the map has too much detail, and consequently suffers in clarity.

R.F.D.

Birds in Hull. A Hull Museum publication. Edited by **Patrick J. Boylan.** Pp. 16. Price 1/-. 1967.

A small booklet containing a systematic checklist of species of birds seen within the city boundary of Hull. The records are based mainly on a recent six year survey carried out by members of the vertebrate section of the Hull Scientific and Field Naturalists' Club.

M.D.

The Watcher at the Nest by **Margaret Morse Nice.** Pp. 159 with 19 illustrations by Roger Tory Peterson. Dover Publications, 1967; agents Constable and Co., 10–12 Orange Street, London W.C.2. 12/-.

This is a new edition of a book first published as long ago as 1939. Dr. Nice's name will always be associated with the Song Sparrow. Her monograph on the species was real pioneering in this type of intensive study. Approximately half the present volume deals with her seven years devoted to the study of this same species. It is charming and at times unashamedly anthropomorphic.

In the remaining half the nesting habits of Mourning Dove, Cowbird and Yellow-crowned Night Heron, among others, are described. There is a strong plea for the setting aside of areas as reserves, to 'look at the humble beauty of waste places not with prejudice but enlightenment . . . '.

R.F.D.

A Wealth of Wildfowl by **Jeffery Harrison.** Pp. 176 with 24 black and white plates + 2 maps. Andre Deutsch. 30/-.

'This is a book about wildfowl; about ducks and geese. It is also a book about Man; about the impact of Man on those duck and geese'. Such is the declaration of intent of Dr. Jeffery Harrison which is achieved so well in this excellent book.

After a survey of the traditional migratory routes of wildfowl, the value of national and international wildfowl counts is assessed, as are the contrasting effects of man's role in the provision of refuges and his destructive tendencies by the drainage and pollution of wetlands. The section dealing with the creation and management of wetlands should be read by all conservationists, ornithologists, wildfowlers and farmers; and those concerned with reserves with a population of wildfowl should heed Dr. Harrison's 'tale of constant change from Wigeon to Woodpeckers' due to plant succession and changing water levels. The frankly told story of the early attempts to unite the efforts of conservationists to those of the wildfowler is told with humour and understanding, and the illustrations by Mrs. Pamela Harrison — another ornithologist in this remarkable family — admirably support the well-written text. This enjoyable book should be owned by all with any interest in wildfowl.

J.D.P.

Where to Watch Birds by **John Gooders.** Pp. 313 with 12 pages of photographs and numerous maps. Andre Deutsch. 30/-.

One of the best things about bird-watching is that it can be enjoyed anywhere. The Camargue, Spurn Head, Buckingham Palace or your own back garden all provide bird-watching in different forms. But we all know of areas which are especially good for birds, attracting them in quantity or quality or a mixture of both. This new book by John Gooders gives explicit directions for reaching more than five hundred such areas in England, Wales and Scotland, grouped alphabetically in counties and with brief details of local societies and any particularly relevant books. Concise instructions on routes, Ordnance Survey one inch map references, details of how to obtain permits and help with local accommodation where likely to be required, are all given. The most interesting regular species of each area are listed under seasonal headings. Passage migrants and unusual or localised winter visitors are also indicated. Fortunately, the author agrees that breeding birds should be disturbed as little as possible and those who buy this book to find rare breeders will have wasted their money. Others, however, will find it a most valuable guide which will increase the pleasure and scope of their bird-watching and their money will be well spent. D.F.W.

Birds of Australia. Volumes I and II. Text by **A. Rutgers,** illustrations from lithographs by **John Gould.** Each volume pp. 160, with 80 colour plates. 1967. 35/- per volume.

These two volumes are yet more examples of large, sumptuously illustrated books on birds which are appearing in increasing numbers. The two books are little more than collections of colour reproductions taken from lithographs by John Gould, the great nineteenth-century English bird artist. They were originally published in Gould's mammoth work *The Birds of Australia*, which contained some 600 illustrations and filled seven volumes. Some species from New Zealand and New Guinea were included.

Altogether 160 species are figured, but only the barest details of range and breeding are given in the text, and in many cases it seems that the author has been hard pressed to find material to fill the page. In a number of instances he has had to resort to his extensive knowledge of the habits and history of the species in captivity to help him out. Gould prepared some of the plates solely from a few specimens sent to him and some of the birds in his illustrations show a peculiarity of proportion and a grotesqueness of posture. In the opinion of this reviewer they do not show the conviction and authenticity of Gould's later work for *The Bird of Great Britain*, published in 1862. There are some fine illustrations of such interesting species as Kakapo, the newly rediscovered Noisy Scrub Bird, and the now extinct Huia. The reproduction, which was done in Holland, is very good, and the whole book is well designed and attractively produced. A publication which will appeal to relatively few, for it's aesthetic quality rather than it's practical value. M.D.

Natural Selection and Heredity by **P. M. Sheppard.** Third edition. Pp. 192 with 9 figures. Hutchinson University Library, 1967. Paperback 11/6, Hardback 27/6.

This student text deals with heredity in relation to the mechanism of evolution, with especially notable reference to studies on natural polymorphisms. It was first published in 1958, is a lucid and admirable book which has become widely appreciated and deservedly popular, and it scarcely needs any further commendation here. Invaluable for undergraduates, it can be read with profit by anyone interested in the subject.

Those possessing either of the earlier editions will want to know the extent of the present revision. There are numerous minor amendments and additions, too many for all to be mentioned here. The most extensive and perhaps most significant alterations concern the account of industrial melanism in *Biston betularia,* (the Peppered Moth), although those relating to the polymorphisms found in *Cepaea nemoralis* and *Papilio dardanus* are also important and of considerable interest. A most welcome feature is that the present edition is available in paperback form at a price which is considerably reduced in comparison with the original hardback edition of 1958.

J.D.L.

Introduction to Experimental Ecology by **T. Lewis and L. R. Taylor.** Pp. xii + 401 with one plate and numerous text figures. Academic Press, London and New York. 1967. 37/6.

The authors clearly state in the introduction to this volume that their aim is to guide the teacher and student through the principles of ecology to a quantitative understanding of the dependence of living animals on their changing environment. It is essentially a practical guide. In the fourth chapter, 45 exercises are described in detail: these consist either of simple experiments or simple planned observations illustrating very diverse aspects of ecology, from behavioural responses, interdependence of species, distribution studies and the assessment of population density, to population changes and community structure. This chapter is well supported by one on tabular and graphical representation of results and on statistical assessments, by another on apparatus and techniques and by a well-illustrated chapter on keys to the major groups of land invertebrates. An extensive appendix incorporates much useful reference material for statistical analyses. The authors are to be congratulated on such a useful practical guide. The incorporation of more references in a future edition would be valuable. The account of exercise 33 for instance is clearly based on Cameron's paper, and although the figure on p. 204 is acknowledged 'after Cameron' I can find no reference to his paper.

E.B.

Microecology by **J. L. Cloudsley-Thompson.** Institute of Biology's Studies in Biology Series No. 6. Pp. 48, 1 plate, 15 text figures. Edward Arnold Ltd. Paperback 7/6, Hardback 12/6.

This book describes the various kinds of crevices in which animals live, e.g. the interstices in soils, rotting logs, leaf litter, etc., and larger cavities such as caves and the nests of social insects. Methods of climatic measurement in small spaces are briefly reviewed together with a brief account of some of the animals occurring there and their adaptation for this mode of life. Treatment is straightforward and elementary, although the style is often slipshod and in many places the author slips into banalities as for instance on p. 44 where we are told that 'air humidity fluctuates between wide limits except in microhabitats where a high moisture content is usually retained'.

E.B.

Empires in Anarchy by **W. B. Collins.** Pp. 138, with 8 drawings by Rita Parsons. MacGibbon and Kee. 1967. 36/-.

The empires are those of the ants and termites and the species are mainly African. This is an account for popular consumption of some of the more striking features of the ant communities and it includes some of the author's own observations. The driver ants are featured prominently and the book opens with a rather disagreeable account of death by torture. The author stresses the biting, stinging and generally destructive powers of his subjects and one is not left with any feeling of affection for these insects.

J.H.F.

Leeds and its Region edited by **M. W. Beresford** and **G. R. J. Jones.** Pp. xviii + 298 with 15 plates, 47 figures and 33 tables in the text. Published by the Leeds Local Executive Committee of the British Association for the Advancement of Science and obtainable from Austick's Bookshop, 21 Blenheim Terrace, Leeds 2. Softback 35/–, Hardback 50/– plus 4/6 postage.

This volume was prepared for the recent British Association meeting and both in format and in the range of information which it contains it makes an interesting comparison with that produced for the last B.A. meeting in Leeds in 1927. The book contains 27 chapters and is divided into four parts. The first part deals with the physical and human setting. Professor Versey, Dr. Bartley and Dr. Broadhead contribute excellent general accounts of the geology, vegetation and fauna of the West Riding. Other articles in this section cover climate, landforms, agriculture and soils, prehistoric archaeology, preconquest history, place names and dialects. The second and third parts deal, in nine chapters, with the growth and development and the present economy of Leeds and its region, and the final section contains six chapters dealing with the contributions of Leeds to medicine, the biological and earth sciences, the mathematical and physical sciences, science in industry and education. It is impossible to do more here than allude to the very wide scope of the subjects dealt with. No one with any interest in local history and affairs or in the sciences and their particular connection with Leeds and the adjacent area, will fail to find this very diverse and comprehensive survey by more than a score of highly qualified contributors, a permanently useful source of information about the town and the region. W.A.S.

Hydrogeological Map of North and East Lincolnshire. Institute of Geological Sciences, London. 1967. 42/-.

In any planning which involves the establishment of new towns or of new industries, it is important to have adequate information about the availability of satisfactory water supplies. Very often the data bearing on this problem are scanty and in recent years, the Institute of Geological Sciences (formerly the Geological Survey) has been carrying out regional studies to remedy this deficiency and this map is the first issued by the Water Department of the Institute. It shows the results of their studies in Lincolnshire where there are three aquifers of major economic importance, namely, the Lincolnshire Limestone, the Spilsby Sandstone and the Chalk. For each of these rocks, the average level of the water-table in the area of outcrop and the pressure surface where the rock is covered are shown. The map is on the scale of half an inch to one mile and is surrounded by diagrams on a smaller scale giving variations in hardness for each aquifer. The particular problem in the Grimsby area where large abstraction of water has led to the infiltration of salt water is illustrated by a larger scale diagram.

A written account of the hydrogeological conditions in the area will be published shortly but the map by itself provides a wealth of information for all those whose prosperity depends on an adequate water supply. H.C.V.

The Peoples of Kenya by **Joy Adamson.** Pp. 400 with 268 paintings, sketches and photographs and end-paper maps. Collins. 4 gns.

Joy Adamson has achieved an international reputation from her books on Elsa and descriptions of animal life in the forests and reserves of Central Africa. But her interests have always been wide and throughout the 30 years she has lived in Kenya, and her very frequent journeyings there and elsewhere in Africa, the peoples amongst whom she travelled and their ways of life have been a constant source of fascination to her. Already an accomplished flower painter, she taught herself to paint portraits and, as the present book amply demonstrates, acquired great skill in depicting, often under difficult conditions, the men and women of the many tribes through whose territories she travelled. The present book is a personal and discursive account of six and a half years spent in travelling to all parts of Kenya for the purpose of painting the men and women, boys and girls, warriors, witch doctors and others with whom she came in contact and recording some of their tribal customs. The book is profusely illustrated by her paintings and photographs and though she modestly disclaims any attempt 'to cross the threshold of anthropology' the record is a considerable contribution to anthropological science as well as being a very readable and unassuming account of the day to day experiences of a versatile, perceptive and courageous woman.

W.A.S.

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with the assistance as referees in special departments of
R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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THE YORKSHIRE NATURALISTS' UNION

Chislett Memorial Lecture — Preliminary Notice

In view of the Joint Y.N.U.–Y.N.T. Conference at York this coming September, the next Chislett Memorial Lecture will not now be held until 8th March, **1969.**

The meeting will be held in the Leeds University Adult Education Centre, 37 Harrow Road, Linthorpe, Middlesbrough. Robert Spencer, ringing officer of the British Trust for Ornithology will speak on 'Progress and prospects in migration research'.

Please make a note of this date.

Ornithological Section

Would members please note that records for Vice-County 63 should now be sent to C. Bower, 17 Woodland Rise, Silkstone Common, Nr. Barnsley, who has succeeded J. Cudworth as Ornithological Recorder for that area.

The R.S.P.B. requests that anyone who discovers any bodies of oiled seabirds report the matter to them. Forms for reporting these are available from the R.S.P.B. at The Lodge, Sandy, Beds.

Annual Subscription 30/– (post free) payable in advance to The Yorkshire Naturalists' Union, The University, Leeds 2.

A STUDY OF A LONG-EARED OWL ROOST

J. S. ARMITAGE

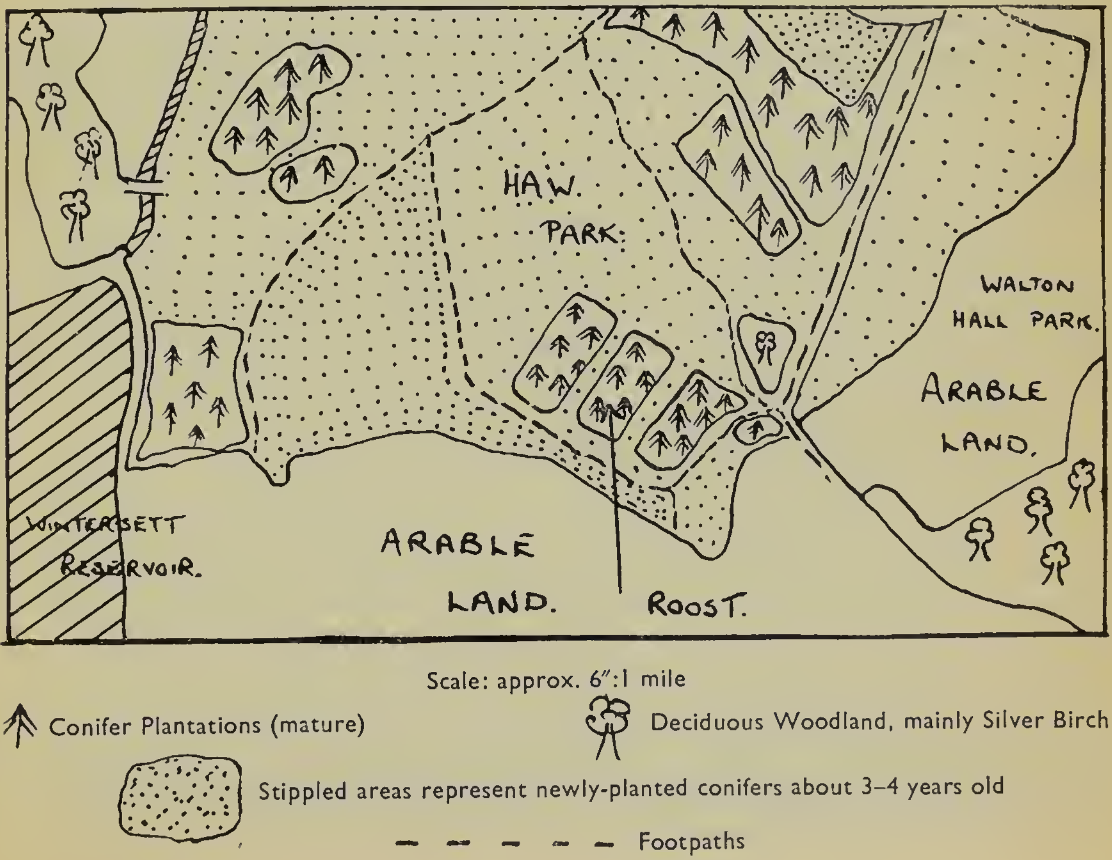
During the months of November–March inclusive in several past years Long-eared Owls (*Asio otus*) have been recorded staying throughout the period, or part of the period, in Haw Park near Wakefield, South Yorkshire. Records of some of these occurrences have been cited previously (see Y.N.U. Ornithological Reports, 1960 and 1962). On the 15th February, 1958, eleven pellets were collected and analysed by the late J. C. S. Ellis, quantitative results for the series being given in the Y.N.U. Ornithological Report for 1958. Further reference to these is made in this paper.

Although most ornithologists will have a general idea of the diet of the Long-eared Owl, much work having been carried out on the Continent and, to a lesser extent, in Britain, I decided to try and find out what species and numbers of prey were caught in the above area and also to collect information on occurrence, hunting methods, pellet formation and ejection, and the general feeding patterns of nocturnal owl species.

The following data is derived from work I undertook in the area during the winters of 1963–4 and 1964–5. The site used during both winters was the same, although in previous winters completely different sites had been used (pers. comm. J. Cudworth) about a half mile to the west.

In assembling this data the following methods were used. Collections of pellets were made at the end of each calendar month in which the birds were resident, wholly or in part. They were then dried and individually analysed and in addition those specimens collected in the second winter, with the exception of fragmented ones, were measured. The mammal remains were identified by using the skull character key given by Southern (1964) and the method adopted of using the skull(s) present as an estimate of the number of prey items (Southern, 1957). The bird prey was identified by T. M. Clegg with the aid of material present at Doncaster Museum. The data on mammal distribution was gained by setting simple back-break traps in the area and by the collection of any relevant visual records. Unfortunately numerical data based on transect line trappings was not collected, so information as to density of, or fluctuations in, populations present within the area is not available. Available literature was tabulated for comparative and factual information.

Map showing various habitats surrounding roosting site.


HAW PARK
WALTON HALL PARK.
ARABLE LAND.
WINTERSETT RESERVOIR.
ARABLE LAND.
ROOST.
Scale: approx. 6":1 mile
Conifer Plantations (mature)
Deciduous Woodland, mainly Silver Birch
Stippled areas represent newly-planted conifers about 3–4 years old
Footpaths

The General Hunting and Roosting Area

The roosting sites were situated in the central one of three larch plantations (see map above), being well protected from the wind and, to a certain extent, from human interference. Although the plantation used was the same in both winters the location of the actual roosting sites changed within it. The trees used were within nine feet and twelve feet of the plantation's edge; the width of the plantations was approximately 111 feet and the mean height of the perches eight feet. The birds usually roosted within a few feet of one another unless previously disturbed. The sites described by J. Cudworth in previous winters were radically different, being large pine trees in more open 'stands'.

The rides or gaps between the plantations were approximately forty-eight and sixty-three feet wide respectively and were planted with Japanese Larch (*Larix leptolepis*). These were barely fifteen inches in height in the second winter and gave easy access to open ground from the trees in the plantation, the mean height of which was seventeen feet.

Reference to the map will show that in the afforested area different habitats for mammal populations were present and these probably had a direct influence on the prey species taken at various times. The map represents the area as it was in the relevant winters of 1963–4 and 1964–5. Felling of woodland, growth of the then very young conifers, and even changes in footpaths have since altered the appearance of the area considerably.

The newly planted areas of conifers varied as regards their vegetative cover as they were in different stages of development, some being virtually ploughed-up land with plants only just visible above the furrows and others having young conifers fifteen inches in height. This is particularly significant when the distribution of Short-tailed Field Vole and Long-tailed Field Mouse is taken into consideration, as detailed below.

Relevant Mammal Species in the Area

As stated previously, no numerical data was collected to determine mammal densities or fluctuations, but the following is rather a synopsis of random trapping and observations made over quite a long period, before, during, and following the study periods.

The most abundant mammal is the Short-tailed Field Vole (*Microtus agrestis*) which, although present in high numbers, especially during the 1964–5 winter, is limited to the surrounding fields and the very young, newly-planted conifers. I have never trapped this species in a mature plantation although they appear to be present in all suitable areas between and adjacent to them. Of all the mammal species this appears the most difficult to trap, although recent use of pitfall traps suggests their being more efficient than the simple back-break ones.

In the autumn of 1966 trapping in areas that, in 1964–5, held young conifers and a Short-tailed Field Vole population now provided more cover and appeared to be supporting Long-tailed Field Mice (*Apodemus sylvaticus*) only. This suggests that the Short-tailed Field Vole evacuates the growing plantations when they reach a certain height, these then being available for colonisation by Long-tailed Field Mice, but that no contestation takes place, initially, by the latter for occupation of the habitat. The changes in these species' population densities might well affect the diet of the Long-eared Owl, if this were studied in the area over a series of winters.

The Long-tailed Field Mouse is abundant in the plantations with tussocky grass and bracken, but due to most plantations being in close proximity to each other a certain amount of transference must occur. The Common Shrew (*Sorex araneus*) appears abundant in all habitats but as this species may be particularly 'trap prone' care must be taken not to rate its numbers too high; however, in neither winter did its numbers appear to fluctuate. The Bank Vole (*Clethrionomys glareolus*) is certainly less abundant than *A. sylvaticus* but it is a little more widespread in its distribution, especially in thick cover alongside fields and the park's boundaries. The Water Vole (*Arvicola amphibius*) and the Water Shrew (*Neomys fodiens*) occur on the fringe of the area, i.e. around Wintersett Reservoir, although the latter is sometimes known to spread into less typical habitats, especially woodland. The Mole (*Talpa europaea*) is present and abundant in suitable areas within and surrounding the area. The Brown Rat (*Rattus norvegicus*) is abundant in the surrounding rural area but no actual records are held by me for the area under review.

PAST RECORDS FOR THE SITE

From observations made over the last six winter periods, i.e. from the winter of 1959–60, it would appear that the birds are present in most years, and from records referring to former years (pers. comm. J. Cudworth and W. C. Wakefield) it would seem likely that birds have resided there in winter for a considerable number of years.

Perhaps it is not the dates of arrival and departure which are important so much as their coincidence with records of obviously continental birds on the east coast of Yorkshire. This suggests the birds may be of continental origin, and further perusal of facts from widely different sources tends to support this (Tables 1 and 2).

TABLE I

Autumn arrival dates of Long-eared Owl at Haw Park and some East Yorkshire coastal sites

Year	Haw Park	Spurn	Flamborough	Redcar	Comments on Haw Park site
1957–8	(15/2/58)	16/11/57	—	—	Visit by Ellis
1958–9	No observations	No records	on vessel offshore 20/11/58	—	
1959–60	20/2/60	10/10/59	31/1/60	—	Site first seen by me
1960–1	4/12/60	15/10/60	—	—	Only date birds noted
1961–2	No records	No records	—	—	
1962–3	29/12/62	12/10/62 10/11/62 several	23/12/62	10/11/62	
1963–4	7/3/64	3/11/63 21–9/10/63 several	2/11/63	1/11/63	Roost site changed prob. arrived earlier
1964–5	–/12/64	7/10/64	—	—	

TABLE II

Latest recorded spring dates for Long-eared Owl at Spurn and Haw Park

Year	Haw Park	Spurn
1959–60	23/3/60	5/4/60
1960–1	see Table I	No records
1961–2	No records	No records
1962–3	17/3/63	12–15/4/63
1963–4	11/4/64	No records
1964–5	–/1/65	No records

During the years cited above I have never proved the Long-eared Owl to breed in Haw Park, or even to be present during the period late spring to late autumn. The dates of arrival and departure tend to suggest the birds may possibly be of continental

TABLE III

Ringing returns of Long-eared Owls

* denotes birds ringed as nestlings

	Ring numbers	Date of ringing and recovery	Ringing and recovery sites				
1	AH 2411	15/11/59	Newburgh	:	57° 19′ N.	2° 01′ W.	Aberdeen
		29/8/61	near Stade	:	53° 34′ N.	9° 37′ E.	Germany
2	R C 20751*	9/6/63	Zwönitz	:	50° 38′ N.	12° 49′ E.	Germany
		27/12/64	South Hetton	:	54° 49′ N.	1° 27′ W.	Durham
3	L 500048*	31/5/59	Wassenar	:	52° 08′ N.	4° 20′ E.	Netherlands
		10/4/60	Gotham	:	52° 52′ N.	1° 12′ W.	Nottingham
4	L 391526*	20/5/64	Den Helder	:	52° 56′ N.	4° 44′ E.	Netherlands
		7/10/64	Spurn	:	53° 35′ N.	0° 06′ E.	Yorkshire
5	M D 364176	1/11/59	Ribatschi	:	55° 11′ N.	20° 49′ E.	U.S.S.R.
		1/3/60	Beaminster	:	50° 49′ N.	2° 44′ W.	Dorset
6	D 176	24/10/34	Ribatschi area	:	(55° 11′ N.)	(20° 49′ E.)	U.S.S.R.
		30/3/36	(Utrecht)	:	52° 08′ N.	5° 10′ E.	Netherlands
7	?	19/10/52	Falsterbo	:	55° 23′ N.	12° 50′ E.	Sweden
		16/3/56	Selby	:	53° 45′ N.	1° 08′ W.	Yorkshire
8	OB 831. 694	12/11/60	Ottenby, Öland	:	56° 12′ N.	16° 24′ E.	Sweden
		13/1/61	Åkirkeby	:	55° 04′ N.	14° 56′ E.	Denmark
9	GBG D43681*	28/5/59	Orrefors, Småland	:	56° 48′ N.	15° 45′ E.	Sweden
		–/12/59	Billys-Aisne	:	49° 23′ N.	3° 20′ E.	France
10	SS 22793	1/11/64	Fair Isle	:	59° 32′ N.	1° 37′ W.	Shetland
		8/11/64	Zandvoort	:	52° 22′ N.	4° 31′ E.	Netherlands

origin, and information from R. G. Hawley's work on a local breeding population in North Derbyshire supports this if used contrastingly. These latter birds begin claiming territory in February and are usually breeding by late March to early April, a period when the Haw Park birds are still communally roosting, the disappearance of the latter then coinciding with occurrences of birds on the east coast of Yorkshire. The method of roosting also seems to differ radically from known local breeding birds, which never appear to roost communally. Hawley states that even early in the year at a breeding site the adults usually roost some distance apart, often as much as seventy-five yards, and on only two occasions has he found a pair roosting together.

It must be admitted that this deduction is rather tenuous and open to criticism, but it must be remembered that the observations refer to one site only and, as such, cannot be used to generalise from, though the facts seem to suggest the Haw Park birds are not of local origin. Moreover the immigration, in winter, of the Long-eared Owl to Great Britain can be assumed to occur regularly. The ringing results given below lend much support to this, and suggest there is a south-westerly or west-south-westerly movement of the species across the continent of Europe in autumn, although in some instances a direct southerly movement can be noted.

Reference to the few examples in Table 3 show that continental birds do come to Britain in winter even in their first year (examples 3 and 4) and that they appear to remain here in spring after our birds have generally begun breeding although, referring to the dates on which the pulli were ringed, little difference is apparent as regards the timing of the breeding season. As the roosts are used annually, the question the last statement poses as to whether the winter visitors are in the main immature birds, is left open, though one would think certain adults accompany the immature birds in order to locate the roost.

On Fair Isle the species 'occurs almost every year in spring and autumn, more regularly in the latter period, in very small numbers. Spring records are between the 18th February and 26th June, mostly late March to early May, and there are no records of more than two birds. Autumn records in the past fifteen years have all been between 7th October and 8th December, mostly late October and early November, usually single birds but up to eight noted at peak' (Davis, 1965).

Use of Roost Site

Since the winter of 1963–4 the site used has been the same; previous to this an alternative one was used at the opposite side of the plantation. On the three occasions on which I have suspected birds to have arrived within the previous few days, they appeared nervous and were easily disturbed. After being present for a short period however, they can be easily approached, on occasions to within four yards. I have only recorded single birds flying outside the plantations in full daylight on four occasions, this appearing to be leisurely movement between the stands of timber rather than a hunting foray, as usually they remained perched in a conifer unless disturbed.

When the owls were disturbed during the daytime they manifested two methods of dispersal depending, I think, on the severity of the 'fright factor'; either they (1) flew through the trees a short distance and then rose above them to fly into another plantation, if severely disturbed or, (2) 'dropped' between the trees and flew almost at ground level, usually to remain within the plantation a short distance from the original roosting perch if they became aware, for instance, of someone observing them.

The number of birds using the site has varied; during the 1959–60 winter a maximum of five occurred. Four were present on the 4th December, 1960, the only date the species was recorded that winter, but since then the number has not exceeded three.

It is significant that the owls remained in the roost throughout the severe winter of 1962–3 and apparently suffered no hardship, although conditions for catching mammals and presumably the additional energy reserves needed to combat such extreme conditions must have been a problem. On visits to the park during that period, other birds were rarely seen, so that the possibility of their diet being supplemented by preying upon birds was negligible due to lack of supply. During the most severe weather when snow drifts two-three feet deep were present, the birds began to roost very close to the ground, presumably to gain a little more protection, although immediately conditions improved they resumed their normal roosting sites. Unfortunately no work was undertaken during that winter when results would have been invaluable, as far as diet is concerned, for comparison with subsequent relatively mild winters.

ANALYSIS OF PELLETS COLLECTED

During the two winters a total of 99 pellets was collected, 39 in 1963–4 (whole ones only) and 60 in 1964–5 (52 being whole). Unfortunately the birds were not present in either winter for a long period, so the opportunity to examine a long series of pellets did not present itself.

(a) Size

The size of the pellets was found to vary considerably; the results of measuring 52 whole pellets collected during December, 1964 and January, 1965 are given in Table 4.

TABLE IV

Analysis of measurements of 52 pellets of Long-eared Owls, Haw Park, winter 1964–5 and comparative figures of other workers

	MINIMUM			MAXIMUM			MEAN	
	Own	South	Ticehurst	Own	South	Ticehurst	Own	South
Greatest length	1.5 cm.	2.0 cm.	3.6 cm.	5.0 cm.	6.0 cm.	5.0 cm.	2.86 cm.	3.76 cm.
Greatest breadth	1.2 cm.	1.4 cm.	1.9 cm.	2.6 cm.	2.7 cm.	2.1 cm.	1.86 cm.	2.02 cm.

As can be seen from the above, the sizes of the pellets were similar to specimens collected by Ticehurst (1939) and South (1965) in other localities.

(b) Prey content

The 39 pellets collected in the 1963–4 winter contained 55 prey items, or 1.4 per pellet; the 52 whole pellets collected in the 1964–5 winter contained 72 prey items, or 1.38 per pellet. The mean number of prey items per pellet for the series was therefore 1.4 (127 prey items contained in 91 pellets).

Table 5 below shows the number of contained prey items per pellet. It would seem that such figures fluctuate widely, as South (1965) records 31.5% of pellets analysed to contain one prey item only, whilst Ticehurst (1939) records 61%, which emphasises the difference and also compares very closely with the figures derived from both series in Haw Park.

TABLE V

Analysis of pellets of Long-eared Owls, Haw Park, 1963–4 and 1964–5 winters, to show number of contained prey items per pellet

Contained prey items per pellet	1963–4 series	1964–5 series
One item	61.5%	65.4%
Two items	35.9%	25.0%
Three items	2.6%	7.7%
Four items	—	—
No items	—	1.9%

The last item in the table for the 1964–5 series was a small, nearly round pellet containing fur, red shale and a leaf; this was considered to comprise the residues present in the stomach, and subsequently expelled, after a pellet containing an actual prey item had already been ejected. The small quantity of red shale, a covering of which had been laid along the main tracks within the Park, suggested that this and other owls hunted along the edges of these and either fed there or moved into cover on the other side, as several other pellets contained very small pieces.

The analysis of the prey content of both series can be seen in Table 6, prey items from all pellets being considered in this instance.

TABLE VI

Prey found in pellets of Long-eared Owls, Haw Park, 1963–4 and 1964–5 winters

The figures in brackets are the number of prey items from which the percentages are derived

Prey species	1963–4 series %		1964–5 series %	
Short-tailed Field Vole	49.1	(27)	67.9	(55)
Long-tailed Field Mouse	16.4	(9)	17.3	(14)
Bank Vole	20.0	(11)	4.9	(4)
Paridae sp.	3.6	(2)	1.2	(1)
Greenfinch	5.5	(3)	—	—
Linnet	1.8	(1)	—	—
Redpoll	—	—	2.5	(2)
Yellow Bunting	—	—	2.5	(2)
Passer sp. (prob. *P. montanus*)	—	—	3.7	(3)
Indeterminate	1.8	(1)	—	—
Insect — Carabidae	1.8	(1)	—	—
	100.0%	(55)	100.0%	(81)

From the above the general prey type totals can be arrived at as given in Table 7 below.

TABLE VII

Prey type totals of pellet analysis given above

Prey type	1963–4	1964–5
Mammals	85.5%	90.1%
Birds	12.7%	9.9%
Insects	1.8%	—

Although it must be stressed that the number of pellets analysed in both series was small, the results are comparable with and in some cases support statements made by previous workers. Ticehurst (1939) gave 80.1% as the mammal prey present in the pellets he collected from various counties in England, and South (1965) found that mammals formed 86.6% of prey in pellets he collected in South Lancashire.

Uttendörfer (1952) found, in a long study involving 43,000 mammal and 6,000 bird prey items, that Short-tailed Field Vole constituted 47% of the total, Bank Vole

6%, 'mice' 16% and shrews 5%. Except for the latter, these figures correspond very closely with those in Table 6.

Since the choice of prey must be made from that available, differing abundance in different years must cause the prey species and prey type totals to fluctuate. Zimmerman (1950) found that the mammal prey of a German breeding pair fluctuated between 65.5% and 99.5% of the total over a four year period, but in winter roosts I would suggest the minimum value to be much higher than his lower figure, mammal prey constituting upwards of 80%. Presumably leaf fall and diminished vegetation cover generally in autumn serve to expose small mammals sufficiently well to enable owl species to concentrate their hunting on them, although Uttendörfer states that in Germany more birds (12% of the total prey) are taken, due to longer snow cover and, also, that a Short-tailed Field Vole deficit is usually made up by preying on either Long-tailed Field Mouse or birds.

As stated above the general results agree with those presented by previous workers but, in addition, several factors of local interest arise which warrant discussion. But first, it seems relevant to give a general synopsis of actual pellet formation and ejection and its connection with hunting activity, since papers presenting data of this type, save those for academic use only, usually give no details of this, though it is essential to the general reader for a more complete understanding of the topic. Primarily the Long-eared Owl is a nocturnal hunting species with, presumably, maximum times of activity at dusk and towards dawn outside of the breeding season. During hunting forays from the diurnal roost I am inclined to think the bird hunts a specific area, having within it a number of 'resting sites' and throughout the night it remains in the hunting area, where the first meal can be digested before the second is taken.

According to research carried out on the feeding habits of the Short-eared Owl (*Asio flammeus*) by Chitty (1938) it is exceptional for two meals to be taken before the ejection of a pellet. This poses a problem concerning any quantitative analysis deduced from the collection of pellets, as a number approaching even 50% could be ejected away from the roosting sites at a bird's occasional hunting perches. Relevant to the general criterion 'one meal — one pellet', is the state of hunger and therefore the availability of food which determined whether one or two meals should be taken before the ejection of a pellet. Young Tawny Owls (*Strix aluco*), according to Southern (1954), may eject several pellets from one meal, this perhaps being true for the young of all owl species, although in a winter roost one would think the feeding-ejection pattern would have reached an adult state with first-winter birds.

The periods of ejection of pellets are interesting and noteworthy for various species, as they differ somewhat. The Tawny Owl ejects two pellets during the night and rarely any during the day at the 'station diurne'. Guérin, who studied the Barn Owl (*Tyto alba*), has shown that the bird usually ejects two pellets, a 'pelote nocturne' and a 'pelote diurne'. The remains of the prey taken at dusk are ejected at the 'station nocturne' prior to the second meal being taken at dawn, the prey remains from this being ejected at the 'station diurne'.

Chitty shows that in Short-eared Owl the 'pelote nocturne' is likely to be retained longer than the 'pelote diurne'. This could mean that occasional pellets resulting from prey taken at dusk, could be ejected at the roosting site ('station diurne') due to the pellet having been retained in the stomach if there had been no prospect of a meal at dawn due, for example, to hunting conditions being bad. The ejection of a pellet is a conscious not a reflex action so that, if a particular meal has proved insufficient and no other seems immediately likely, the pellet may be retained, the prospect of a meal then hastening expulsion (Chitty, 1938). The actual ejection of a pellet, as recorded by Chitty, is accompanied by a certain amount of obvious nausea. At each ejection the residual contents of the stomach amassed from the previous one, rarely two, meals are expelled more or less completely. Small bones may, however, be retained in the stomach until the formation of a further pellet.

Chitty found that mammals under 10–12 grammes weight were swallowed whole, head first, but larger specimens tended to be eaten by portions. Clegg (pers. comm.), however, thinks that most species of owl could manage whole prey specimens in the region of 20–25 grammes weight, the only selectiveness he has recorded in captive specimens being the removal of the head of certain birds. The ejection of pellets is made necessary by the ingestion of the prey as a whole, and then by certain physical and chemical factors in the birds' make-up.

The prime reason for any owl having to eject bones is the low acid content in the stomach, which does not facilitate their breakdown. In 1928 the Reeds investigated pellet formation in the Great Horned Owl (*Bubo virginianus*) by means of fluorescopic examination of ingested food mixed with barium paste. Several extremely interesting facts are given by them, namely: (1) that little or no free acid was present in the stomach contents or in the pellets, the figure given never exceeding 0.437%, (2) the high placement and small size (1 mm.) of the pyloric opening formed a mechanical bar to the passage of any residues and, (3) the flesh was liquefied by very high peptic activity of the gastric juices, the remaining residues, i.e. bones and hair, mixing easily due to the feeble musculature of the stomach.

Thus, from the above facts, some of which, if not all, will be similar in Long-eared Owls, it may be concluded that the length of the period of formation and retention of a pellet varies, the fully formed specimen being ejected at will, its ejection often being intimately connected, it would seem, with environmental influences. Many of the above facts warrant further investigation, comparison being made between one species and another, as little data of this type appears to exist.

HUNTING METHODS AND PREY PREFERENCE

From the data given in Table 6 it can be seen that Short-tailed Field Vole is the most common prey species, obviously because it is the most abundant mammal in the suitable areas adjacent to the roost; these being the arable area to the south and the newly-planted coniferous areas (see map). This shows that most hunting took place over open ground. Long-tailed Field Mouse and Bank Vole appear to supplement the diet to a large degree but Common Shrew, although seemingly abundant in all habitats, was not recorded at all although Ellis (1958) recorded one as being present in the pellets he examined.

In the 1963–4 series Short-tailed Field Vole prey numbers were low, the deficit appearing to be made up by Bank Vole, as the percentages of Long-tailed Field Mouse remained similar in both seasons. Thus it would seem that in the presence of a low number of Short-tailed Field Vole, Bank Vole was preyed upon, as it inhabited more open ground than Long-tailed Field Mouse. The following serves to illustrate another factor that can have a direct effect on the prey content of pellets.

In 1963–4, especially at the end of March and the beginning of April, there were several days when strong or fresh winds were prevalent. Pellets collected during and immediately after this period contained Long-tailed Field Mouse and Bank Vole to a large degree, showing hunting to have taken place in a sheltered habitat, i.e. within the immediate environs of the roosting plantation, as vegetation in exposed places, i.e. in the habitat of Short-tailed Field Vole, was much disturbed. From twelve pellets collected after this presumed 'adverse hunting' period the following data was derived: three pellets contained Bank Vole and Short-tailed Field Vole, four pellets contained Bank Vole and Long-tailed Field Mouse, three pellets contained Bank Vole only, and five pellets contained Long-tailed Field Mouse only. These, I think, show sufficiently well that hunting had been concentrated in a fairly well-vegetated habitat.

On the 2nd April, 1964, during the above period, the birds were seen to leave the roost at 19.05 hours G.M.T., their colours just being discernible. One bird flew immediately to the top of a larch, which was being swayed by a Force 6 easterly wind, but then dropped between the plantations and commenced hunting there. During windy periods such as this the birds appear to rest on or at a low vantage point and watch for prey which is presumably what they do during the night, a point which Hawley has also personally suggested to me.

Usually the hunting technique was a haphazard quartering movement, with slow, deliberate glides about three feet from the ground. On two occasions, however, I have seen a bird of this species using a hovering technique somewhat similar to that of a Kestrel (*Falco tinnunculus*). On the observation date cited above one of the birds flew above a plantation using the wind, remaining stationary for a few seconds over certain points, presumably attracted by Turdidae that were becoming agitated below. These roosting birds did not move out of the trees but were much disturbed by the owl's presence. Subsequently, on the 12th April, 1964, at Spurn Bird Observatory and in the company of W. F. Curtis, I observed a bird hovering over an arable field behind the Warren, a short time after it had been ringed there, the usual hunting technique being reverted to when it was disturbed.

This raises an interesting point, as both Hawley and I think that birds are taken while roosting. Southern (1954) also states that birds taken by Tawny Owls in winter are usually those species that roost near the tops of trees or bushes. Whether, in the first quoted observation above, the bird was attracted by the movement its presence had incurred below, or whether it was attempting to scare out some of the confused birds cannot be decided, but it serves to record that a hovering technique may be used when hunting. Hawley also comments (pers. comm.) that W. E. Gibbs, a Sheffield taxidermist, claims that, in the past, when working in an area of Lincolnshire where Long-eared Owl was common, he has found nests of various small birds including those of Bullfinch (*Pyrrhula pyrrhula*) and Song Thrush (*Turdus philomelos*), in which there were eggs and the head only of the adult. This he attributed to hunting Long-eared Owls. From this, then, it is obvious that much work remains to be done, even in this sphere, to gain a full knowledge of the various techniques involved in the taking of bird prey.

SUMMARY

(1) Details of a winter roosting site of the Long-eared Owl (*Asio otus*) in South Yorkshire are given, the types of surrounding habitat and mammals present also being described.
(2) The history of the site is reviewed and the dates of arrival and departure of the birds compared with those of obviously continental birds on the east coast of Yorkshire and in other localities.
(3) Pellets collected in the winter periods 1963–4 and 1964–5 were measured and analysed and the results compared with those of other workers.
(4) A synopsis of the general feeding patterns of owls and the formation and ejection of pellets is made, details being drawn from the work of several authorities.
(5) The prey preference of the Haw Park birds is discussed and certain observed methods of hunting commented upon.

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DOWITCHER AT SETTLE

W. R. HIRST, J. G. IRELAND and F. J. ROBERTS

South of Settle in the West Riding of Yorkshire, the river Ribble meanders through several square miles of flat marshy land between the villages of Rathmell, Wigglesworth and Long Preston. Part of this area (near Wigglesworth Hall) is overgrown with rushes and very marshy, and is kept for duck shooting; the rest is mainly water-meadow. The area is attractive to many species of water birds, particularly when flooded; some standing water is often present, especially in winter. On the weekend of 19–20th August, 1967, when about half of this area was under flood water, fourteen species of wader were recorded, including about two thousand Curlews (*Numenius arquata*), a similar number of Lapwings (*Vanellus vanellus*), about ten Ruffs (*Philomachus pugnax*), a Black-tailed Godwit (*Limosa limosa*), Green and Wood Sandpipers (*Tringa ochropus* and *T. glareola*) and about four hundred duck, mainly Mallard (*Anas platyrhynchos*) and Teal (*Anos crecca*).

On the following Saturday, 26th August, 1967, when both the floods and the numbers of birds were much reduced, W. R. Hirst and J. G. Ireland covered this area. At about 12.00 hrs. (B.S.T.), W. R. H. had a brief glimpse of an unfamiliar wader which landed in a section of private marsh and was not followed up. At about 18.30 hrs., F.J.R. arrived and with J.G.I. met W.R.H., who had just seen again the unusual wader. This time the bird had flushed from a small open pool and flown onto the muddy river-bank some hundreds of yards away. As we approached the river the bird again flushed from under the banking (overhanging at this point), with a Greenshank (*Tringa nebularia*), at quite close range — about 40 yds. Although the sky was mainly cloudy at this time, the sun was shining, and we had a good view of the two birds in flight together, with the sun behind us, as they flew away and finally dropped again onto the river bank about a mile further north. Both birds called continuously. We had a further view, at less than ten yards range, as the bird was disturbed, again with a Greenshank, from a muddy stretch under an overhanging bank where three or more Greenshanks appeared to be roosting. The light had deteriorated greatly by this time (about 20.00 hrs.) as the sky had clouded heavily, and no further details could be determined. The call was again heard. We retired, hoping the bird would roost overnight here.

DESCRIPTIONS:

W.R.H. (8 × 40 binoculars):

"Seen only in flight on four occasions. The general impression was of a very dark bird both above and below. Size — just smaller than Greenshank, more compact, and less lanky. The legs did not project so far beyond tail as Greenshank. Upperparts — dark brown, sometimes looking blackish; this colour appeared patchy, not a uniform colour. Rump, and far up back, white. Tail did not look white as in Greenshank but was noticeably in contrast with rump: it appeared brownish, but lighter than rest of upperparts. Underparts — a very dark rich brown colour, again patchy. Head slightly paler.

Call-note highly distinctive — not so fluty as Greenshank, of a higher pitch, harsher and more rapid. Rendered as 'kri, kri' or 'krik, krik'. Sometimes a triple call, more usually double.

The flight was fairly slow with regular wing beats, similar to Greenshank. When disturbed it flew long distances before pitching and called regularly."

J.G.I. (10 × 50 binoculars):

"Seen twice in flight with Greenshank.

A wader similar in size to Redshank (*Tringa totanus*), i.e. rather smaller than Greenshank. In flight the bird had an area of white on the back extending down onto the rump, and appearing to merge with brownish blotching on the upper tail-coverts. The tail looked very dark. The underparts were a deep red-brown colour. The legs extended only a very short distance behind tail. Call 'ku-ku', not fluty as Greenshank."

F.J.R. (10 × 50 binoculars):

"Bird seen in flight with a Greenshank. Very *Tringa*-like in shape and actions. Compared with Greenshank, rather smaller, plumper, generally less rakish; feet only just showing beyond tail. Bill longish, similar to Spotted Redshank (*Tringa erythropus*) in length. Plumage — overall very dark coloured, reminiscent at a distance of Spotted Redshank in 'black' breeding plumage. Upperparts and wings dark brown, mottled and barred with paler markings. Underparts — a deep rusty colour. Head and upper breast paler. Rump white, and white extending to a patch on the back, producing, when viewed from the side, the unusual effect of a white line leading between the wings. Tail dark (apparently heavily barred) — unlike the Greenshank, which gave the impression of a white tail. Flight, with quite regular, even, wing-flaps, much as Greenshank.

Call — a rapid 'krrk, krrk'; usually two, sometimes three notes, grating and croaking, more rapid than Greenshank and not musical as that bird. This call was used continually when the bird was flushed; no other note was heard."

J.G.I. and F.J.R. returned the following morning, 27th August, when the weather was calm, fairly clear and sunny. At about 09.00 hrs. (B.S.T.), F.J.R. located the bird feeding alone on a marsh pool at about 70 yds. (measured by pacing later). He was able to watch the bird through 10 × 50 binoculars for about a minute, while it stood anxiously in the water. Finally it relaxed and began feeding again. As F.J.R. approached further, under cover, the bird flew off calling and finally dropped again (apparently) on a marsh about a half-mile to the north. (J.G.I. was on the opposite side of the river about a quarter-mile away and did not see the bird.)

The next twelve hours were spent in searching the area but the bird was unfortunately not seen again. We were unable to contact J. R. Mather, our usual arbiter on ornithological matters, after several telephone calls; but as the bird was apparently absent in any case we did not contact other observers for confirmation.

When seen on the ground, the bird had a plump appearance, with neck drawn in and bill pointing downwards. It seemed about the size of a Redshank (although no other birds were available for comparison), but more compactly built. From a distance the bird appeared blackish; on inspection through binoculars the plumage details were easily made out. The back was blackish, the feathers with noticeable rusty or orangy tips and edgings. The underparts were a rusty colour, marked with black, becoming a deep rich rusty-brown on the flanks, giving the bird a 'bronzed' appearance in the sunlight (shining from behind the observers). The belly and under-tail were not clearly seen. The head, neck and upper breast provided a marked contrast to the rich colouring of the rest of the body, as these parts were shades of grey. Crown and back of neck medium grey: sides of head, throat, etc., and upper breast paler. There was a conspicuous pale eyestripe. The bill was long and straight, similar in length to spotted Redshank, but heavier; the basal half was pale, the tip dark. The bird was standing in water so that neither the length nor the colour of the legs could be determined. (The water was fairly shallow at this point, however, and a bird with longish legs, e.g. Spotted Redshank, would probably have shown a length of leg above the surface). The white on the back was not visible. As the bird began to feed, the neck was craned forward and the head held high with the bill downwards at a steep angle, while the bird took short steps forward. The bill was occasionally pushed into the water and moved up and down in the manner of a Godwit, before the bird moved on. When the bird flushed, its call and flight pattern were observed to be as before.

From the description we were able to identify the bird as a North American Dowitcher (*Limnodromus* sp.), apparently an adult moulting from summer plumage. I. C. T. Nisbet (in *British Birds*, **54** (9), 352), says that in North America, the call is regarded as the best identification mark between the two species of Dowitcher. Our bird had a call very similar to that described by Nisbet for the Short-billed Dowitcher (*Limnodromus griseus*). As the conditions precluded the observation of the other diagnostic structural and plumage features discussed in the paper, however, we felt unable to identify the bird specifically.

On Aggression by **Konrad Lorenz.** Pp. xiii + 273. Methuen, University Paperback edition. 10/6.

This important book (reviewed in *The Naturalist* 33, 1967), by an author who is as notable for the lucidity of his writing as for his penetrating mind is now available as a University Paperback.

THE LEPIDOPTERA OF YORKSHIRE

(*continued from* 1967, *p.* 96)

Apamea crenata Hufn. (Clouded Bordered Brindle).
Both forms are common and widely distributed.

A. lithoxylea Fabr. (Light Arches).
Widely distributed and often common.

A. sublustris Esp. (Reddish Light Arches).
There are only two records in the last thirty years.
61. Everingham, common in the early 1900's; Thixendale, one at sugar, 2nd July, 1964.
64. Askham Bog, in numbers in the 1920's, but not again until July, 1965.

A. zollikoferi Frey. (Scarce Arches).
Several of the handful of British specimens of this rare migrant have occurred in the county.
62. Near Middlesbrough, 26th September, 1903.
63. Methley, 12th August, 1910.
64. Kirkstall, 15th August, 1939.

A. monoglypha Hufn. (Dark Arches).
Generally one of our commonest moths.

A. hepatica Hubn. (Clouded Brindle).
Not at all common but occurs in small numbers in widely separated localities.
61. Osgodby, July, 1963; near Selby, occasional at sugar.
62. Pickering, several, 29th June, 1963.
63. Barnsley, 1905; Sheffield, 1955 and 1956.
64. Harrogate, 1957 and 1960; Knaresborough, 1962; Gateforth Woods near Selby, 11th July, 1963.

A. scolopacina Esp. (Slender Brindle).
Taken in small numbers, mainly in the wooded areas of the West Riding, but seldom referred to as common.
63. Birkinshaw, 17th August, 1966; Halifax; Little Horton, 7th August, 1960; Deffer Wood, 1910 and 1957; Sheffield, common in some years, e.g., 1955; Skelmanthorpe, 1926; Wakefield, 1908; Wath-on-Dearne, 15th July, 1958.
64. Bishop Wood, 28th August, 1955; Brayton Barff near Selby, 1930; Harrogate, 1957 to 1960; Knaresborough, 1962; Selby area, 7th August, 1956.

A. ypsilon Borkh. (Dingy Shears).
Occasionally recorded as common in a district but it appears to be very local.
61. Selby area, larvae not uncommon on Willow.
63. Little Horton, at light, 26th July, 1959; Sheffield, fairly common; Skelmanthorpe.
64. Leeds, at light; Harrogate, one, 4th August, 1957.

Aporophyla lutulenta Borkh. (Deep Brown Dart).
Only seen in the Doncaster area since the Second World War until reported near Filey in 1966.
61. Muston near Filey, three, 14th to 23rd September, 1966.
62. Ayton, 1906; Scarborough, 1914.
63. South of Doncaster, 1930's and 1940's; Rossington Bridge, 18th September, 1959.

A. nigra Haw. (Black Rustic).
Although common in parts of Westmorland this moth has been recorded only once in Yorkshire in the past fifty years.
63. Near Bradford, one, 12th September, 1964.

Dasypolia templi Thunb. (Brindled Ochre).
This moth used to be widespread and not uncommon, but it is now very seldom recorded in the county except on the East Coast.
61. Muston near Filey, regularly at light, several in October, 1966.
62. York area, not since the early 1930's; Farndale Moor, six at light, 18th October, 1960? (1966, *Entomologist's Rec. J. Var.*, 133); Scarborough, regularly at light in recent years.
63. Low Moor, Bradford, up to 1935; Sheffield, three, 7th and 14th October, 1957 and 6th October, 1958.
64. Barlow near Selby, one male 29th September, 1953.

Antitype flavicincta Fabr. (Large Ranunculous).
Like the last species, it is seen much less now than in the early part of the century.
62. Northallerton, one, 1st October, 1945; Robin Hood's Bay, larvae, 20th July, 1946; York district, up to the early 1930's.
63. Huddersfield, not since about 1924; Wakefield, one, 15th September, 1958.
64. Elland, one, September, 1948, and in earlier years.

A. chi Linn. (Grey Chi).
Widely distributed, mainly on higher ground.
63. Little Horton, often common; Sheffield, common; Selby district, not common.
64. Harrogate, not uncommon; Malham.
65. Meltham, Richmond.

Griposia aprilina Linn. (Merveille-du-Jour).
Not uncommon among Oaks and frequently taken by digging for pupae.
61. Selby, not common; Skipwith.
62. Buttercrambe, 1933.
63. Sheffield, uncommon; Shipley Glen; Skelmanthorpe; Mirfield, 1922.
64. Bishop Wood; Bolton Abbey; Grassington; Harrogate; Knaresborough.

Meganephria oxyacanthae Linn. (Green Brindled Crescent).
Generally distributed and often common with a fair proportion of the melanic form.

Brachionycha sphinx Hufn. (Sprawler).
Fairly well distributed in the eastern and northern parts of the county but very few records in the West Riding.
61. Escrick Park, 1917.
62. Buttercrambe; near Malton, one larva, 1960; Sand Hutton; Newton Dale, Pickering, larvae, 1932.
63. Edlington Wood, 1919; Stutton, Tadcaster, 1957.
64. Bolton Abbey, one larva, 1953; Knavesmire Wood, York.
65. Richmond area.

Euplexia lucipara Linn. (Small Angle-shades).
Generally distributed and often common, particularly among ferns and bracken.

Phlogophora meticulosa Linn, (Angle-shades).
Found all over the county and often common in the autumn.

Celaena haworthii Curt. (Haworth's Minor).
Evidently abundant on most moors where Cotton Grass (*Eriophorum vaginatum*) grows freely.
61. Skipwith Common, abundant.
63. Little Horton, near Bradford; moors near Sheffield; Thornton Moors, near Denholme; Triangle, near Halifax.
64. Rombald's Moor; Ribble Head; Pen-y-ghent.

C. leucostigma Hubn. (Crescent).
Widely reported but never very plentiful and often only taken singly.
61. Kilnsea; Skipwith Common, occasionally.
63. Doncaster, August, 1939; Elland, 1948; Sheffield, one only, before 1959; Skelmanthorpe, 1920; Triangle, near Halifax, one in 1964; Wakefield, one, 20th August, 1956.
64. Askham Bog, not infrequent.

Phalaena typica Linn. (Gothic).
Generally distributed and often common.

Hydraecia oculea Linn. (Common Ear).
The group of four species known as 'Ear Moths' were not separated in the earlier records and their separation remains difficult so that their individual status are difficult to assess. *H. oculea* appears widely distributed, being recorded regularly at Bradford (63) and Sheffield (63) as well as on the coast (61).

H. lucens Frey. (Large Ear).
This is now known to occur widely on the moors; it was first recorded in 1923 at Everingham (61) by Maxwell Stewart.
61. Barlby, 2nd September, 1964; Everingham; Skipwith Common, regularly.
63. Sheffield moors, common; Thorne Moor, 4th September, 1964.
64. Harrogate, 13th September, 1960; Malham Tarn.

H. paludis Tutt (Saltern Ear).

This was also recorded from Everingham (61) in 1923 by Maxwell Stewart. It is now only known to occur at Spurn (61), an ideal habitat for this species.

H. micacea Esp. (Rosy Rustic).

Generally common and very widely distributed. The larvae have been recorded on tomato plants at Little Horton near Bradford (63).

H. petasitis Doubl. (Butterbur).

This species is well distributed among its food-plant which often grows abundantly on river banks, etc. Single specimens are frequently taken at light well away from the natural habitat.

63. Derwent Valley; Elland; Little Horton, near Bradford; Sheffield.
64. Copgrove, two, 1st September, 1958; Harrogate, one, 31st August, 1957 and two in September, 1959; Thorpe Willoughby near Selby 21st August, 1959.

Gortyna flavago Schiff. (Frosted Orange).

Generally distributed and often common.

Nonagria algae Esp. (Reed Wainscot).

Not recorded since Porritt's List.

N. typhae Thunb. (Bulrush Wainscot).

Occurs fairly plentifully wherever the food-plant grows. Larvae and pupae are readily found in the stems of *Typha* while the moths sometimes come to light well away from the breeding ground.

61. Selby district, frequent.
62. Strensall Common.
63. Sheffield; Wath-on-Dearne.
64. Askham Bog; Harrogate; Knaresborough.

N. dissoluta Treits. (Brown-veined Wainscot).

This species was added to the county list by Rev. Ash who took it at Scarthingwell (64) in 1920. It has since been taken in several localities in the Plain of York, but it is unlikely to be detected unless specifically searched for among reeds.

61. Riccall, larvae in 1940; Skipwith Common, 1955 and 1956.
62. Strensall Common, 1938 and 1960.
64. Scarthingwell, both forms plentiful in 1960.

Coenobia rufa Haw. (Small Rufous Wainscot).

There is only one record since Porritt's List, a single specimen at light at Kilnsea Warren (61) in July, 1953. This is another Wainscot with a very restricted flight which should be searched for among its food-plant, *Juncus articulatus* (Jointed Rush).

Chilodes maritima Tausch. (Silky Wainscot).

The first county record was by Arthur Smith who took it at Strensall Common (62) in about 1938. From 1953 onwards it has been recorded fairly regularly in a large reed bed on Skipwith Common (61).

Arenostola pygmina Haw. (Small Wainscot).

Well distributed and often common, particularly in moorland areas.

A. elymi Treits. (Lyme-grass Wainscot).

This coastal species is recorded regularly from the Spurn and Kilnsea area (61). The only other record is from sandhills three miles south of Bridlington (61) in 1914.

A. phragmitidis Hubn. (Fen Wainscot).

There are a number of well established localities, mainly in the Plain of York.

61. Skipwith Common; Spurn.
62. Strensall Common.
64. Askham Bog.

Rhizedra lutosa Hubn. (Large Wainscot).

Widely distributed among reeds, but often taken at light well away from the nearest reed-bed.

61. Barlby; Brayton; Skipwith Common.
62. Buttercrambe, 19th September, 1933; Northallerton, 3rd October, 1945.
63. Bradford; Halifax, 2nd October, 1959; Sheffield; Wakefield; Wath-on-Dearne.
64. Askham Bog; Harrogate, 4th September, 1958; Headingley.

Leucania pallens Linn. (Common Wainscot).

Generally common and widely distributed.

L. impura Hubn. (Smoky Wainscot).
Also common and widely distributed.

L. straminea Treits. (Southern Wainscot).
This species was added to the county list in 1950 when specimens taken by Arthur Smith at Askham Bog (64) were so identified. It has been confirmed from there more recently and a second locality established: Skipwith Common (61).

L. pudorina Schiff. (Striped Wainscot).
Only three localities have been reported, but in at least two of these it is abundant.
61. Skipwith Common, plentiful.
62. Scarborough, June, 1960.
64. Askham Bog, common.

L. obsoleta Hubn. (Obscure Wainscot).
This was added to the list when J. Briggs and C. R. Haxby took a single specimen at Skipwith Common (61) on 30th June, 1957. It has since been found there in some numbers on several occasions and a second locality has been found: Thorne Moor (63), 9th June, 1962.

L. littoralis Curt. (Shore Wainscot).
The only records since Porritt's List are from Kilnsea and Spurn (61). Two were taken on 1st and 8th July, 1950 and it was not seen again until one was taken on 24th July, 1966 at the Y.N.U. field meeting.

L. comma Linn. (Shoulder-striped Wainscot).
Widely distributed but evidently not as common as might be expected.
61. Skipwith Common; Selby.
63. Elland; Gaisby; Halifax; Little Horton; Sheffield; Wath-on-Dearne.
64. Burley Woodhead; Harrogate; Kirkstall.

L. unipuncta Haw. (White-speck Wainscot).
This rare migrant was added to the county list when one was recorded by P. Winter at Filey (61) on 23rd September, 1966.

L. lithargyria Esp. (Clay).
Generally distributed and often reported as common.

L. conigera Fabr. (Brown-line Bright-eye).
Also widely distributed, but not generally as common as the last species.
61. Selby district; Spurn.
63. Gaisby; Little Horton, unusually plentiful in 1953; Sheffield.
64. Askham Bog; Bishop Wood, one 2nd October, 1954, presumably a partial second brood; Harrogate, occasionally.

Stilbia anomala Haw. (Anomalous).
Most recent records are from Upper Grass Wood (64) where it is taken regularly. Until 1966 there were only two other records since Porritt's List.
63. Saltaire, until about 1900.
64. Baildon Moor, 7th August, 1966; Grassington, frequently; Malham Tarn, 12th August, 1966.
65. Sedbergh, 1927.

Meristis trigrammica Hufn. (Treble Lines).
Not as widely distributed as might be expected, but not uncommon in some districts.
61. Kilnsea, once.
62. Pickering; Strensall.
63. Doncaster, regularly, 1914 to 1939; Sheffield, fairly common; Skelmanthorpe; Wombwell, 1960.
64. Harrogate; Knaresborough.

Caradrina morpheus Hufn. (Mottled Rustic).
Widely distributed and generally common, never very numerous but appears steadily over a fairly prolonged period.

C. alsines Brahm. (Uncertain).
Difficult to separate from the next species, it is probably more widespread than the records suggest.
61. Skipwith Common.
63. Sheffield.
64. Harrogate.

C. taraxaci Hubn. (The Rustic).
Apparently commoner and more widespread than the last species.
61. Selby district; Spurn, 1953.

63. Little Horton, near Bradford; Sheffield, common.
64. Harrogate.

C. clavipalpis Scop. (Pale Mottled Willow).

Generally distributed and sometimes common.

Laphygma exigua Hubn. (Small Mottled Willow).

This migrant reaches the county in certain years, 1959 being the most recent good one.

63. Huddersfield, 7th September, 1959; Keighley, eight in 1903; Triangle, near Halifax, 11th and 31st October, 1959.
64. Harrogate, 3rd October, 1959.

Petilampa minima Haw. (Small Dotted Buff).

Fairly widely distributed but only common in a few localities.

61. Hunmanby, 1922; Kilnsea Warren, plentiful in 1954; Skipwith Common.
62. Strensall Common.
63. Little Horton, regularly; Sheffield, fairly common; Skelmanthorpe, common in 1908.
64. Askham Bog; Barlow; Drax; Harrogate, common.

Hydrillula palustris Hubn. (Marsh Buff).

Not recorded since Porritt's List.

Rusina umbratica Goeze. (Brown Rustic).

Widely distributed and often common in the central plain but seldom recorded from the higher ground.

61. Selby district, fairly common in wooded parts; Skipwith Common, very common.
62. Buttercrambe, common on 11th June, 1966.
63. Haw Park, Wakefield, 1912; Sheffield, common.
64. Harrogate, one in 1958 and one in 1961.

Amphipyra pyramidea Linn. (Copper Underwing).

There have been only five records since Porritt's List.

63. Sheffield, one on 4th September, 1956 and one in September, 1966; Triangle, near Halifax, one in August, 1964.
64. Gateforth, near Selby, one on 23rd September, 1937; Harrogate, one on 10th September, 1965.

A. tragopogonis Linn. (Mouse).

Common and generally distributed.

Cosmia affinis Linn (Lesser Spotted Pinion).

A rather local insect which is usually taken as larvae.

61. Muston, near Filey, one in August, 1967; Pocklington, one larva in 1961.
62. Malton, larvae on 29th May, 1967; Sinnington, several larvae, 1946.
63. Cawthorne, 1910; Doncaster, larvae, 1949; Edlington Wood, larvae common in 1919.
64. Copgrove, larvae fairly common in 1959.

C. diffinis Linn. (White Spotted Pinion).

Only recorded once since Porritt's List.

64. Knaresborough, 29th July, 1955.

C. trapezina Linn. (Dun-bar).

Generally distributed and often common in wooded areas, but less frequently taken in the Leeds–Bradford–Huddersfield area.

Enargia paleacea Esp. (Angle-striped Sallow).

Often taken quite freely on the low lying heaths where there is a good growth of mature birch; there are also other records from quite widely separated districts.

61. Allerthorpe Common; Skipwith Common, plentiful.
62. Buttercrambe Woods, 1939; Strensall Common, plentiful.
63. Deffer Wood, 1900–7; Doncaster, one 29th August, 1939; Little Horton near Bradford, one 19th August, 1964; Sheffield, often common.

Zenobia retusa Linn. (Double Kidney).

Only recorded from two localities since Porritt's List.

61. Ricall, larvae on Willow, 15th June, 1940.
64. Askham Bog, early in the century but none since.

Z. subtusa Fabr. (Olive Kidney).

Much more widespread than its co-gener but seldom taken in any numbers.

61. Selby district, occasionally.
63. Bretton near Wakefield, larvae common in 1916; Deffer Wood, two 31st

July, 1957; Sheffield, not common; Shelley Woodhouse, 1920; Wakefield, one 20th August, 1956.

64. Bishop Wood; Gateforth; Harrogate, three 1957–65; Kirkstall, three in 1956.

Gypsitea leucographa Hubn. (White Marked).

This species is still taken regularly in Bishop Wood (64) by working Sallow bloom in April. There is only one other record since Porritt's List, a few being taken at Sallow in 1905 near Middlesbrough (62).

Cerastis rubricosa Fabr. (Red Chestnut).

Widely distributed and sometimes common.

Panolis flammea Schiff. (Pine Beauty).

Well distributed wherever there is plenty of pine.

61. Allerthorpe Common, 1935; Skipwith Common.
62. Buttercrambe, 1933; Strensall Common.
63. Deffer Wood, 1954; Sheffield, fairly common.
64. Bishop Wood; Harrogate; Knaresborough.

Orthosia gothica Linn. (Hebrew Character).

Generally distributed and often very common.

O. miniosa Fabr. (Blossom Underwing).

Not recorded since Porritt's List.

O. cruda Schiff. (Small Quaker).

Widely distributed but not as common as most of the other members of the genus.

61. Skipwith Common.
62. York district.
63. Halifax; Sheffield.
64. Bishop Wood; Harrogate.

O. stabilis View. (Common Quaker).

Widely distributed and often very common.

O. populeti Treits. (Lead-coloured Drab).

Only recorded from two districts apart from its stronghold in Bishop Wood (64).

62. York district, 1933.
64. Bishop Wood, regularly at light, sugar and Sallow bloom; Gateforth near Selby.

O. incerta Hufn. (Clouded Drab).

Generally distributed and often very common.

O. munda Esp. (Twin-spot Quaker).

Widely distributed but by no means common, usually reported in very small numbers.

62. York district, at Sallow bloom in 1933.
63. Deffer Wood, scarce in 1910; Edlington and Wadworth Woods, larvae abundant in 1919; Sheffield, scarce in the 1950's.
64. Bishop Wood, regularly; Harrogate, occasionally.

O. advena Schiff. (Northern Drab).

Not widely reported and of rather irregular appearance where it is taken.

63. Sheffield, scarce.
64. Bishop Wood, not common; Harrogate, occasionally; Thorpe Cuttings near Selby.

O. gracilis Fabr. (Powdered Quaker).

Well distributed but not often common except in the south-eastern part of the county around Selby (61 and 64).

Atethmia xerampelina Hubn. (Centre-barred Sallow).

Fairly well distributed wherever there is plenty of Ash, on which the larvae are taken in the spring.

Omphaloscelis lunosa Haw. (Lunar Underwing).

Local and apparently preferring the low-lying areas towards the south and east. It has not been recorded from such well worked areas as Bradford, Halifax and Harrogate.

61. Barlby, September, 1966; Filey, common in 1966; Kilnsea; Selby district; Skipwith Common.
62. Middlesbrough, 1906; Strensall Common; York district.
63. Sheffield, common.

Parastichtis suspecta Hubn. (Suspected).
Widely distributed and sometimes quite common.
61. Skipwith Common.
62. Strensall Common.
63. Sheffield; Skelmanthorpe, 1906 to 1914; Wakefield 23rd July, 1946.
64. Askham Bog; Harrogate, three 1958 to 1961; Kirkstall, two in 1946; Morton's Bog, near Selby.

Agrochola lota Clerck. (Red-line Quaker).
Widely distributed, particularly among Willows and Sallows, but not often really common.

A. macilenta Hubn. (Yellow-line Quaker).
Rather more local than the last species but widely distributed, particularly in well wooded areas.

A. circellaris Hufn. (Brick).
Generally distributed and often common, except perhaps in industrial areas.

A. lychnidis Schiff. (Beaded Chestnut).
Widely distributed and often common.

Anchoscelis helvola Linn. (Flounced Chestnut).
Widely distributed and often common though not as numerous as the previous species.

A. litura Linn. (Brown-spot Pinion).
Generally common and widely distributed except in some industrial areas.

Tiliacea citrago Linn. (Orange Sallow).
Well distributed and sometimes common as larvae among well established Limes.
61. Skipwith Common.
63. Doncaster; Skelmanthorpe.
64. Gateforth; Harrogate; Leeds district.

T. aurago Fabr. (Barred Sallow).
Widely distributed but not often common. Occurs mainly on Beech but also on Maple and possibly Sycamore.
63. Deffer Wood; Sheffield; Womersley, 1936.
64. Acaster Malbis near York; Brayton; Gateforth; Headingley; Knaresborough; Malham, 1939.

Citria lutea Stroem. (Pink-barred Sallow).
Well distributed wherever Sallows grow freely but not so common as the next species.

Cirrhia icteritia Hufn. (Common Sallow).
Generally common and widely distributed, most plentiful as larvae on Sallow bushes in the spring.

C. gilvago Esp. (Dusky Lemon Sallow).
Widely distributed among Elms on which the larvae are often numerous.
61. Skipwith.
62. Malton district, larvae, 29th May, 1967.
63. Sheffield.
64. Brayton; Burley Woodhead; Burton Leonard; Elland; Gateforth; Harrogate; Knaresborough.

Conistra vaccinii Linn. (Chestnut).
Generally distributed and often common in wooded areas.

C. ligula Esp. (Dark Chestnut).
Fairly widely distributed and sometimes common, particularly in the eastern part of the county.
61. Beverley, 5th October, 1967; Selby district.
62. Scarborough, 14th October, 1967.
63. Sheffield; Skelmanthorpe, 1913.
64. Burley Woodhead, 1960; Selby district, often common in autumn; Tadcaster, frequent at Ivy bloom.

Eupsilia transversa Hufn. (Satellite).
Well distributed and sometimes common in well wooded areas.

Graptolitha ornitopus Hufn. (Grey Shoulder-knot).
Not recorded since Porritt's List until one was taken at light at Sheffield (63) in September, 1965.

Lithomoia solidaginis Hubn. (Golden Rod Brindle).
Not uncommon on some of the higher moors where Bilberry grows freely.

62. Middlesbrough, 1905.
63. Meltham Moor, on tree trunks; Penistone, common in 1908; Pye Nest near Halifax, 1955; Sheffield Moors.
64. Burley Woodhead, 1960; Grassington, 1932; Ilkley, at Cow and Calf Rocks, 1957.

Xylocampa areola Esp. (Early Grey).

Not recorded as often as would be expected, it is certainly local and seldom common.

61. Cliffe Common, one in 1963; Skipwith Common, formerly.
62. Goathland, 1952; Wykham near Scarborough, 1943.
64. Bishop Wood, sometimes frequent; Copmanthorpe near York, 1959; Harrogate, occasionally; Washburndale, three in 1950.

Xylena exsoleta Linn. (Sword Grass).

This species used to be taken quite frequently but since the second World War has been very scarce with only three scattered specimens taken in the autumn of 1960.

61. Everingham, 20th October, 1923; Holme-on-Spalding Moor, one at sugar 22nd October, 1960.
62. Buttercrambe, October, 1933; Scarborough, common at Oliver's Mount, 16th October, 1938 and a few in Raincliffe Woods in March, 1940.
63. Doncaster, frequently up to 1940 when it was common in October, two in October, 1945; Sheffield, occasionally.
64. Harrogate, one at M.V. light, 7th October, 1960; Kirkstall, November, 1943; Scarthingwell, one at Ivy bloom 15th October, 1960; Selby district, before 1940.

X. vetusta Hubn. (Red Sword Grass).

Apart from a few specimens in the Sheffield area (63) in the late 1940's and early 1950's this moth has not been recorded since the end of World War II.

61. Skipwith, 1932.
62. Middlesbrough, 1905; Northallerton, one larva in 1945; Seamer, one larva in 1943.
63. Sheffield, scarce.
64. Askham Bog, larva in 1921; Kirkstall in 1940.

Cucullia verbasci Linn. (Mullein).

Widely reported from a range of localities almost invariably as larvae.

61. North Cave, 1953.
62. Northallerton, 1945; York district in 1960.
63. Bingley, 1938; Bradford, 1939; Huddersfield, 1918; Shipley Glen, 1943.
64. Boroughbridge, 1942; Huby, 1950; Kirkham Abbey, 1920 and 1958; Saxton, 1922; Selby district, 1960's; Wentbridge, 1916.

C. asteris Schiff. (Starwort).

This species was added to the county list when larvae were found at Kilnsea (61) by H. N. Michaelis in August, 1949. This remains the only known locality but larvae have been taken there regularly since that date and were not uncommon on *Aster tripolium* on the occasion of the Y.N.U. field meeting on 24th July, 1966.

C. umbratica Linn. (Common Shark).

Well distributed but not often common; this is the only member of the genus which is usually taken as a moth rather than as a larva.

61. Kilnsea, not uncommon; Selby district, occasionally.
63. Beeston, 1945; Gaisby, two in July, 1954; Halifax, two in July, 1959; Little Horton, near Bradford; Sheffield.
64. Burley Woodhead, several on 26th June, 1960; Harrogate; Knaresborough, 18th July, 1958.

C. chamomillae Schiff. (Chamomile Shark).

Widely distributed and sometimes taken at light in the spring. Working for the larvae will often establish that it is much more plentiful than it otherwise appears.

61. Kilnsea.
63. Little Horton; Sheffield; Wakefield.
64. Barlow; Bishop Wood; Boroughbridge; Brayton, one at light on 3rd October, 1959, a most unusual date; Selby district.
65. Dishforth, larvae, 1962 and 1965.

(*to be continued*)

THE PHYTOPLANKTON OF ROSTHERNE AND MERE MERES, CHESHIRE

J. H. BELCHER
(*Freshwater Biological Association*)
AND JOAN E. STOREY (MRS. J. E. DAVID)
(*University of Bristol*)

Rostherne Mere, Cheshire (National Grid Reference SJ 745843) is a lake of about 46 hectares (115 acres) in extent and up to 30 metres deep. It has been studied by various naturalists, a bibliography being given by Lind (1944), who studied the net phytoplankton for the previous three years. Pearsall (1923) also worked on net samples taken by Tattersall and Coward in 1912 and 1913. Following the acquisition of the Mere by the Nature Conservancy in 1961 as a National Nature Reserve the present survey was started, as an attempt to follow the plankton in more detail and over a longer period of time.

Most of the work was necessarily carried out at a distance, and is therefore limited in scope. However, it has yielded interesting data, especially when viewed in the wider context of other studies being undertaken on this water-body by various workers, now loosely associated as the Meres Research Group. This article summarises the results obtained, and it is hoped they will serve as a basis for more detailed investigations, which are urgently needed. In particular, it may be possible to correlate the large blooms of blue-green algae with the great water-bird population (Nature Conservancy Report for 1961), although nothing more than an account of phytoplankton fluctuations can be given here.

Mere Mere is approximately one third the size of Rostherne, and according to Griffiths (1925) also attains a depth of 30 metres. It is partly surrounded by houses, and its outflow enters Rostherne Mere by way of the Rostherne Brook, about 1.5 kilometres in length.

METHODS

From May, 1962 to November, 1963 regular phytoplankton tows were taken from Rostherne, using a net of 180 mesh. These were monthly until February, 1963 and then fortnightly. From March, 1963 onwards 3-metre vertical tube samples (Lund and Talling, 1957) were taken by the staff of the Nature Conservancy, fixed with Lugol's iodine solution and forwarded by post to the Freshwater Biological Association. For the first year sampling was weekly, and then fortnightly, with monthly samples for the last part of 1966. Larger organisms were estimated by sedimentation counts and smaller ones by examination on a haemacytometer slide following concentration by means of sedimentation. From December, 1964 a 3-metre tube sample was taken from Mere Mere coinciding regularly with the Rostherne samples.

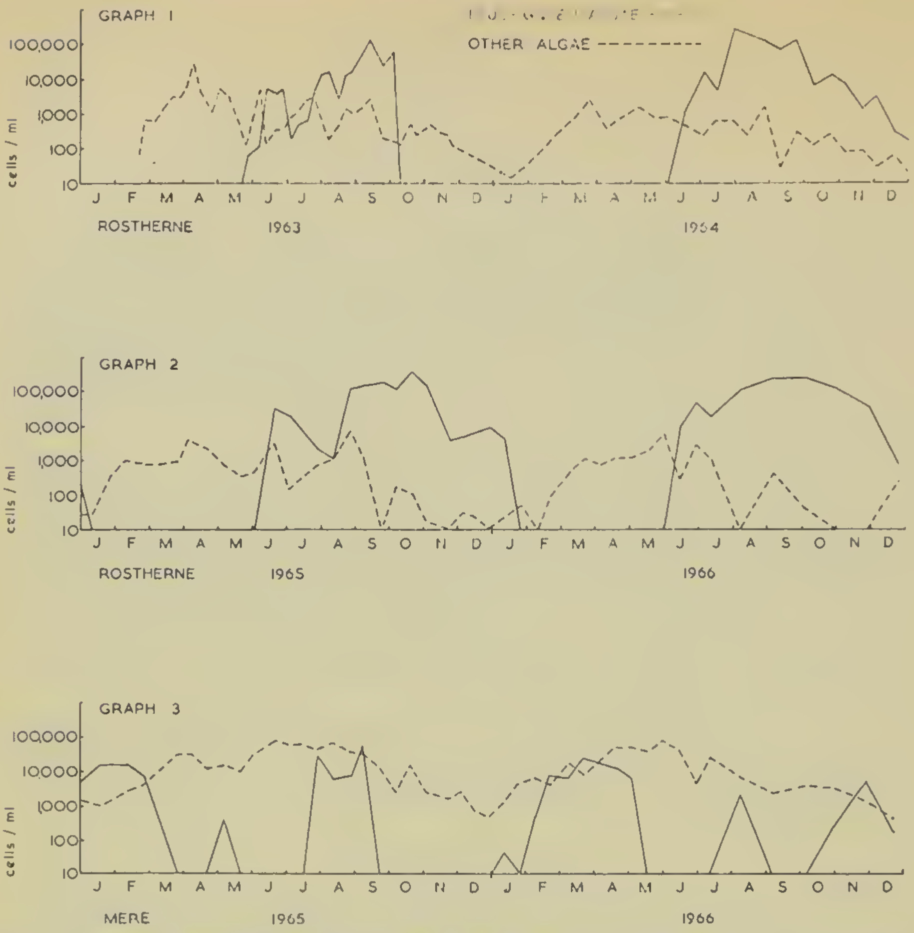
Also during 1963 the development of the thermocline was studied, from its formation in late May to its disappearance during November. In June and July it remained steady at between 5 and 10 metres depth, then gradually sank to 10–15 m. in September and 15–20 m. in October.

RESULTS

The net samples collected during 1962 and 1963 were useful for comparison with the net collections made in 1912–13 and 1941–3 and examined by Pearsall and Lind respectively, and indicate that the blue-green maxima have greatly increased in magnitude during the intervening years. However, the results of the sedimentation estimations made in 1963 demonstrated clearly the great tendency to concentration of the larger forms in the tow-net samples. The following account deals only with inverted microscope and haemacytometer counts.

The phytoplankton of Rostherne is best divided into two components, blue-green algae and those of all other groups. The latter component is present throughout the year, but is generally meagre. Its most constant member is *Rhodomonas minuta* var. *nannoplanktica*, though the peaks shown in Graphs 1 and 2 are usually due to other species, such as *Stephanodiscus tenuis* (April 1963, 24,000 cells per ml.) and *Asterionella formosa* (March, 1965, 5,700 cells per ml.).

Blue-green algae are completely absent from the phytoplankton during the spring, appearing suddenly at the end of May or beginning of June. There is usually a few weeks when *Anabaena flos-aquae* or *Aphanizomenon flos-aquae* is dominant, or there may be a mixture of both. Then *Microcystis aeruginosa* suddenly appears, the former



Graphs 1 and 2: Phytoplankton fluctuations in Rostherne Mere, 1963–6.
Graph 3: Phytoplankton fluctuations in Mere Mere, 1965–6.

species disappearing, and the water becomes green and turbid, like pea soup. The *Microcystis* blooms persist until the late autumn or winter, when they disappear as suddenly as they come. This can be seen on Graphs 1 and 2, where the first peak on each of the yearly blue-green bursts is due to *Anabaena* and *Aphanizomenon*, the later larger more extended peaks being *Microcystis*.

When the latter has reached a maximum and is starting to decline slightly in numbers a large concentration of cells of the bacterium *Sphaerotilus natans* appears in the plankton, up to 30,000 per ml. They occur in short filaments of three to four cells, though considerably longer threads are sometimes seen. The *Sphaerotilus* may disappear in a few weeks or it may persist for three months, as in 1964.

Mere Mere (Graph 3) has a much richer phytoplankton dominated during spring by the centric diatom *Stephanodiscus tenuis*, and at other times of the year, especially in summer, by members of the Chlorococcales, such as *Scenedesmus quadricauda* and *Coelastrum microporum*. Although *Microcystis* was recorded as a co-dominant by Griffiths (1925) it was not observed during the present study, and blue-green algae are now represented mainly by *Oscillatoria agardhii* var. *isothrix*, although *Aphanizomenon flos-aquae* appears occasionally and an unidentified straight species of *Anabaena* has been seen in one sample. The *Oscillatoria* occurs in short bursts at various times during the year, but does not dominate the plankton as do the *Microcystis* blooms of Rostherne.

As stated, the water of Mere Mere flows into Rostherne Mere by way of the Rostherne Brook. By comparison of the phytoplankton counts it was found that when certain species were abundant in Mere they could be found in small numbers in Rostherne, but never had any lasting effect on the plankton. During the months June to October, 1963 weekly phytoplankton net collections were taken from Rostherne Brook near its entry into Rostherne. Phytoplankton organisms were only present in appreciable numbers on three occasions, contrasting with the abundant phytoplankton at the outflow of Mere.

List of species present in counts

(C = common, F = frequent, O = occasional, + = present, — = absent)

	Rostherne M.	Mere M.
(a) Myxophyceae		
Anabaena flos-aquae (Lyngb.) Bréb.	C	—
Anabaena sp.	—	+
Aphanizomenon flos-aquae (L.) Ralfs	C	—
Coelosphaerium kützingianum Näg.	O	—
Gomphosphaeria sp.	+	+
Merismopedia glauca (Ehrenb.) Näg.	+	—
Microcystis aeruginosa Kütz.	C	—
Oscillatoria agardhii Gom. var. *isothrix* Skuja	O	C
O. bornetii Zukal.	+	—
(b) Chlorophyceae		
Monomastix minuta Skuja	O	+
Pedinomonas minor Korshik.	+	—
Scourfieldia complanata G. S. West	+	—
Chlamydomonas spp.	F	C
Eudorina elegans Ehrenb.	O	—
Pandorina morum (O. F. Müll.) Bory	O	—
Pascheriella tetras Korshik.	—	+
Phacotus lenticularis Stein	+	—
Pteromonas aculeata Lemm.	—	O
P. angulosa (Carter) Lemm.	—	C
P. spinosa Nygaard	—	+
Actinastrum hantzschii Lagerh.	—	F
Ankistrodesmus acicularis (A. Br.) Korshik.	—	C
A. falcatus (Corda) Ralfs var. *spirilliformis* G. S. West	O	F
A. fusiformis Corda	+	—
A. subcapitatus Korshik.	O	C
Ankyra judayi (G. M. Sm.) Fott	C	—
Asterococcus limneticus G. M. Sm.	+	—
Botryococcus braunii Kütz.	O	O
B. protruberans W. & G. S. West	—	+
Chlorella sp.	O	F
Chodatella ciliata (Lagerh.) Lemm.	—	O
C. quadriseta Lemm.	+	O
Coelastrum microporum Näg.	O	C
Crucigenia apiculata Schmidle	—	C
Dictyosphaerium pulchellum Wood	O	F
Didymocystis inconspicua Korshik.	O	O
Elakatothrix lacustris Korshik.	O	O
Lagerheimia genevensis Chod.	—	O
Nephrochlamys subsolitaria (G. S. West) Korshik.	—	+
Oocystis sp.	—	F
Pediastrum boryanum (Turp.) Menegh.	O	F
P. duplex Meyen	O	O
P. tetras (Ehrenb.) Ralfs	—	F
Planktosphaeria sp.	—	O
Raphidonema longiseta Vischer	O	F
Scenedesmus acuminatus (Lagerh.) Chod.	O	C
S. bijuga (Turp.) Lagerh.	—	+
S. longus Meyen	—	+
S. obliquus (Turp.) Kütz.	—	F
S. quadricauda (Turp.) Bréb.	F	C
Scenedesmus sp.	+	—
Siderocelis nana Fott & Heynig	+	—
S. ornata Fott	+	O
Sphaerocystis schroeteri Chod. *sensu lato*	F	F
Tetraëdron incus (Teil.) G. M. Sm.	—	F

	Rostherne M.	Mere M.
T. minimum (A.Br.) Hansg.	—	O
Tetrastrum staurogeniaeforme (Schröd.) Lemm.	O	F
Treubaria triappendiculata Bern.	+	—
Closterium acutum Bréb. var. *variabile* (Lemm.) Krieger	O	O
C. gracile Bréb.	O	O
Staurastrum paradoxum Meyen *sensu lato*	O	—
(c) Xanthophyceae		
Goniochloris fallax Fott	—	F
G. mutica (A.Br.) Fott	—	F
Nephrodiella lunaris Pascher	O	O
Trachydiscus lenticularis Ettl	—	O
(d) Chrysophyceae		
Chrysococcus rufescens Klebs	C	C
Dinobryon sp.	+	+
Mallomonas akrokomos Ruttn.	C	C
Pseudokephyrion ellipsoideum (Pascher) Conrad	C	—
Pseudopedinella sp.	—	O
Stenokalyx monilifera Schmid	C	C
Synura sp.	O	O
(e) Bacillariophyceae		
Achnanthes minutissima Kütz.	+	—
Asterionella formosa Hassall	C	O
Cocconeis placentula Ehrenb.	+	—
Cyclotella meneghiniana Kütz.	O+	C
C. pseudostelligera Hust.	+	O
Cymatopleura solea (Bréb.) W.Sm.	+	—
Diatoma vulgare Bory	+	—
Fragilaria capucina Desmaz.	F	—
F. crotonensis Kitton	F	—
Gomphonema constrictum Ehrenb.	+	—

	Rostherne M.	Mere M.
Melosira granulata (Ehrenb.) Ralfs	F	O
M. varians C.Ag.	O	—
Navicula cryptocephala Kütz.	O	—
Nitzschia acicularis W.Sm.	—	O
N. sigmoidea (Ehrenb.) W.Sm.	+	—
Rhoicosphenia curvata (Kütz.) Grun.	+	—
Stephanodiscus astraea (Ehrenb.) Grun.	F	—
S. hantzschii Grun.	C	C
S. tenuis Hust.	—	C
Synedra acus Kütz.	+	—
S. ulna (Nitzsch) Ehrenb.	—	O
(f) Cryptophyceae		
Cryptomonas erosa Ehrenb. *sensu lato*	C	C
C. ovata Ehrenb. *sensu lato*	C	C
Rhodomonas minuta Skuja var. *nannoplanktica* Skuja	C	C
(g) Dinophyceae		
Ceratium hirundinella O. F. Müll.	C	O
Gymnodinium fuscum (Ehrenb.) Stein	C	—
Peridinium sp.	C	—
(h) Euglenophyceae		
Euglena viridis Ehrenb.	—	+
Euglena sp.	O	—
Phacus sp.	+	+
Trachelomonas hispida (Perty) Stein em. Defl.	—	+
T. rugulosa Stein	—	+
T. stokesiana Palmer	+	—
T. volvocina Ehrenb.	O	+

Note: three green flagellates of uncertain systematic position, *Monomastix, Pedinomonas* and *Scourfieldia*, have here been included in the Chlorophyceae, following tradition.

ACKNOWLEDGEMENTS

We are very grateful to the Nature Conservancy's staff at Rostherne, Cheshire, and Attingham Park, Shropshire, who collected all samples in the later stages of the work and also gave help in numerous other ways.

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ENTOMOLOGICAL SECTION AT EDLINGTON WOOD

18th June, 1966

J. H. FLINT AND C. I. RUTHERFORD

The current effort of the Section on the revision of the county list of Lepidoptera has led to much re-reading of the old records, Porritt's List in particular. All those concerned have been struck by the large number of references made to Edlington Wood, near Doncaster, and to a slightly lesser degree to Wadworth Wood. There has been no corresponding mention of these woods in recent reports and the Entomological Survey Committee recommended that they be revisited to see if they could still be regarded as a really fruitful collecting ground.

Permits were readily obtained from Messrs. Jackson-Stops and Staff, the managing agents for Edlington Wood, and from the Forestry Commission for Wadworth Wood. Both were most helpful to us and showed great interest in our proposal, but warned us that the construction of the new motorway M18 on the one hand and of a large housing estate on the other might well have disturbed the wild life of the woods by comparison with earlier years. The systematic clearing and natural regeneration of the woods also has its effect on wild life, but on balance this is probably an advantage in that large open areas with plenty of low plants and shrubs tend to encourage insect life.

In the event the weather was good and about ten members spent the greater part of the day in the woods, mainly but by no means entirely in Edlington Wood where we made our base at the Woodhouse. Unfortunately no members were able to stay on after dark to work with M.V. light so that a representative list of night-flying moths was not obtained; from what we were able to record we believe that such an operation would be well worth while.

The following species were recorded:

Lepidoptera

Pieris brassicae L. (Large White)
P. rapae L. (Small White)
P. napi L. (Green-veined White)
Euchloe cardamines L. (Orange Tip)
Vanessa cardui L. (Painted Lady)
Ochlodes venata B. & G. (Large Skipper)
Achlya flavicornis L. (Yellow Horned) as larva
Drepana falcataria L. (Pebble Hook-tip)
Plusia gamma L. (Silver Y)
Dysstroma truncata Hufn. (Common Marbled Carpet)

Xanthorhoe montanata Borkh. (Silver Ground Carpet)
Hydrelia flammeolaria Hufn. (Small Yellow Wave)
Earophila badiata Hubn. (Shoulder Stripe) as larvae
Eupithecia castigata Hubn. (Grey Pug)
Abraxas sylvata Scop. (Clouded Magpie)
Lomaspilis marginata L. (Clouded Border)
Cabera pusaria L. (Common White Wave)
Plagodis dolabraria L. (Scorched Wing)
Cleora repandata L. (Mottled Beauty) as larva
Eurrhypara hortulata L. (Small Magpie)
Hapalia olivalis Schiff. (Olive Brindled Pearl)

Hymenoptera

Calameuta pallipes Klug
Athalia cordata Lep.
A. lineolata Lep.
Tenthredopsis nassata L.
Tenthredo mesomelas L.
T. livida L.

Hemiptera Heteroptera

Macrotylus solitarius Mey.

Hemiptera Homoptera

Speudotettix subfusculus Fall.
Thamnotettix confinis Zett.
Cixius nervosus L.
Cercopis vulnerata Ill.

Diptera

Syrphus balteatus Deg.
Eristalis nemorum L.
Xylota sylvarum L.

Coleoptera

Orsodacne cerasi L.

In the main, members' attention was devoted to the Lepidoptera and most of the other insects noted above were netted whilst watching for moths to 'break cover'. The plant life of the woods was naturally of interest but as no botanist was present no list was prepared. We were struck by the considerable number of fair-sized Small-leaved Lime trees (*Tilia cordata*), an uncommon tree which has recently been brought to the attention of all lepidopterists because of its association with the Scarce Hook-tip (*Drepana harpagula*) in the Wye valley. Two rather local herbaceous plants were noted; the Spurge-laurel (*Daphne laureola*) and the Wild Columbine (*Aquilegia vulgaris*).

It will be seen that no Lepidoptera of great significance were recorded. The date had been chosen in the hope of finding two uncommon geometers recorded in the past. In spite of the abundance of Dogwood (*Thelycrania sanguinea*) there was no sign of the Little Thorn (*Cepphis advenaria*) which is not difficult to disturb in day-light. The Waved Carpet (*Hydrelia testaceata*) was said in Porritt's List to be abundant at rest on Alder trunks; we were not able to find a good stand of mature Alder so were not able to look for this moth.

We concluded that these woods still provide a good and varied habitat, and that if worked regularly, principally at night for moths, they could be expected to yield a number of worthwhile records.

Stomach contents of Dogfish

In the course of dissection of a male dogfish (*Scyliorhinus caniculus*) a skeleton of the thecate hydroid (*Dynamena pumila*) complete with its basal growth was found in the pyloric limb of the stomach. The cardiac limb contained the remains of crab, herring and the customary large number of worms.

Ellen Hazelwood — *Canon Slade Grammar School*

A review of the
PROTECTION OF BIRDS ACTS, 1954 TO 1967

CHARLES H. WILSON
Hon. Sec. Protection of Birds Act Committee, Yorkshire Naturalists' Union

The lack of knowledge of the Protection of Birds Acts, due very largely to their complexity and the legal phrasing of the various clauses, makes it difficult for persons interested in the protection of our wild birds to take an active part in protecting them. The following summary of some of the provisions of the Acts and their related Statutory Instruments, which is not intended to cover all aspects of them, or be fully comprehensive, may be of some help.

1. The Protection of Birds Act, 1967 was introduced on the 14th July, 1967 and comes into force on the 14th January, 1968.

   The 1967 Act amends parts of the 1954 Act and adds new provisions and with the (amendment) Act, 1964, they can all be referred to officially as the Protection of Birds Acts, 1954 to 1967.

   In reviewing this recent Act, it seems sensible to include also the amendments made to the 1954 Act by the various Statutory Instruments made from time to time, but in order to keep within reasonable bounds and to avoid innumerable complications, to restrict these to the ones which affect us in Yorkshire.

2. ALL WILD BIRDS, THEIR NESTS AND EGGS ARE PROTECTED BY THE ACT AT ALL TIMES. This applies to all species, whether mentioned or not in the schedules to the 1954 Act, those in the first schedule being protected under special penalties, with the following general exceptions:

   (a) AN AUTHORISED PERSON, usually defined as the land owner or some person having his authority, on his own land can kill or take at any time, any bird mentioned in the Second Schedule to the 1954 Act. This includes Cormorant, Shag, common predatory Gulls, the Crow family, Pigeons, House Sparrows and Starling.
   AN AUTHORISED PERSON can also take the eggs of Wild Ducks, Geese or Swans for the purpose of hatching them.

   (b) Any person may take for any purpose the eggs of a bird in the Second Schedule, or the eggs of the Black Headed Gull or Common Gull for food for either human consumption or as food for ornamental wildfowl or poultry. He may also take the eggs of a Lapwing before the 15th April in any year for his own consumption, but it is now illegal to sell, offer for sale, barter or exchange or import Lapwing eggs and therefore it is illegal for Hotels and Restaurants to offer Lapwing eggs on their bills of fare.

   (c) Subject to the following conditions and outside the Close Season, shooting is permitted of birds listed in the Third Schedule of the 1954 Act, which includes the game birds, wild ducks and geese with certain exceptions, Coot, Moorhen, etc. (but the Brambling and Black Tailed Godwit listed with them are now fully protected at all times).

      (i) It is illegal to shoot these birds in Sanctuaries and Reserves for example Spurn, Fairburn or the Humber Sanctuary or to enter the Humber Sanctuary between the 1st Sept. and the 20th Feb.

      (ii) It is illegal to shoot these birds on Sundays in the North and West Ridings of Yorkshire and the County Boroughs of Doncaster and Leeds.

      (iii) It is illegal to sell, offer for sale, or have in ones possession for sale, barter or exchange, unless specifically licensed, any dead wild goose of any species at any time, or any other bird listed in the Third Schedule between the 28th February and the 31st August in any year.

   It should also be noted that although the Protection of Birds Acts, 1954 to 1967 permit these birds to be shot subject to the conditions outlined above, offences against other Laws can still make shooting them illegal, for example:

(iv) Shooting on land without the permission of the owner.

(v) Shooting within the prescribed distance of public footpaths and roads.

(vi) Shooting within Public Parks or Recreation Grounds subject to local Byelaws.

(vii) Shooting certain game birds without being in possession of a game licence.

(viii) Possessing or using a shot gun (from 1st May, 1968) or rifle without a Police Certificate.

For information the Close Season referred to above, in which these birds are fully protected is:

Capercaile, Pheasant, Woodcock	1st Feb. to 30th Sept.
Partridge, Coot, Moorhen Golden and Grey Plover Redshank, Curlew	1st Feb. to 31st Aug.
Snipe	1st Feb. to 11th Aug.
Grouse	11th Dec. to 11th Aug.
Wild Ducks and Geese. Below the high water mark of ordinary spring tides	21st Feb. to 31st Aug.
in all other areas	1st Feb. to 31st Aug.

3. An entirely new section has been added to the Act, in that it is now an offence to wilfully disturb any bird in the First Schedule, that is the rarer species and may include any birds in Sanctuaries or Reserves, at or near their nests containing eggs or young, unless official approval has first been obtained from the National Environment Research Council, but the disturbance by authorised persons of birds in the Second Schedule in Sanctuaries and Reserves is not an offence.

   Disturbance includes photography and the inspection of the nest, but does not restrict photography or nest inspection outside sanctuaries of birds not included in the First Schedule.

4. Another revised section of the Act refers to ringing or marking birds and makes illegal the use of nets, mist nets or any other devices for taking birds in flight or rocket or cannon nets for birds on the ground, unless they are operated by licensed or authorised persons. Application for ringing licences should be made to The National Environment Research Council.

5. The use of Gas, poisoned, poisonous or stupefying substances to take or kill wild birds as well as Bird Lime, Gins, Traps and Electrical Devices to frighten them are prohibited unless a special licence has first been obtained from the Secretary of State, the National Environment Research Council or the Ministry of Agriculture and Fisheries.

6. The Secretary of State may declare an extension of the Close Season for any species named in the Third Schedule, if severe weather conditions persist, to give these birds special protection.

7. It is illegal to catch and keep; or to sell any species listed in the Fourth Schedule of the Act, unless these birds have been bred in captivity and close ringed when young. This schedule includes all those birds which are good songsters or have attractive plumage. The only exception to this being that in certain circumstances a licence may be issued by The Secretary of State enabling certain species to be taken for aviculture.

8. It is illegal, with certain special exceptions and unless specifically licensed, to sell, or offer for sale any live wild bird, any egg of a wild bird, including blown eggs, or the skin or plumage of any wild bird recently taken.

9. It is not an offence under the Protection of Birds Act, 1954 to 1967 if a person kills or attempts to kill any wild bird other than those listed in the First Schedule, which are fully protected at all times under special penalties, if he can satisfy a Court of Law that:

   (a) By so doing he has prevented serious damage to crops, vegetables, fruit, growing timber or to fisheries.

(b) The bird being so seriously injured that he killed for humane reasons, or that he took the bird being injured with a view to bringing it back to health and then releasing it.

(c) A licence has been obtained from The Secretary of State to take or kill within a specified area a bird in the First Schedule to prevent damage as in (a) above.

(d) That the act of killing, or disturbing a bird in the first schedule in a Sanctuary, was an incidental result of a lawful operation and could not reasonably be avoided.

10. Additional powers have been given to Police Constables under the 1967 Act whereby they may search without warrant any person or property, if it is suspected that this search will reveal an offence against birds listed in the First Schedule, that is the rarer species. The following birds have been added to the original list; Barn Owl, Red Backed Shrike and Sparrow Hawk, but the Collared Dove has been removed although it still has full protection.

11. A specific section of the 1967 Act states that the Council of any County or County Borough may take such steps as they think expedient for bringing the effect of these Acts to the attention of the public and I strongly recommend that individuals of the Yorkshire Naturalists' Union press their local Councils to do just this to give publicity to these Acts and to see they are observed by the general public.

12. The wording of these Protection of Birds Acts, 1954 to 1967 and the Statutory Instruments seem to be unnecessarily complicated and in the preceeding paragraphs I have attempted to make them readily understood even if in some instances the full details and implications have not been quoted.

The implementation of the various sections of the Acts should be undertaken by all nature lovers and any breaches observed reported with relevent facts, names of persons concerned, witnesses, date and time of day, etc., to the local Police Office and also to the Honorary Secretary of the Protection of Birds Act Committee of the Yorkshire Naturalists' Union either by letter or telephone at the address given below so that appropriate action and if possible prosecution of offenders can be undertaken. It is essential to ensure that the Act is fully enforced and understood by the general public and maximum publicity given to prosecutions so that our wild birds are given the full protection they deserve. It is strongly recommended that all persons interested in protection should obtain copies of the Acts, details of which are given below.

REFERENCES:	Protection of Birds Act	1954.	Price 1/-
	,, ,, ,, ,,	1954 (amendment) Act 1964.	Price 3d.
	,, ,, ,, ,,	1967.	Price 1/-
	Statutory Instruments	1955. No. 1286.	Price 2d.
		1955. No. 1532.	Price 2d.
		1957. No. 318.	Price 3d.
		1961. No. 470.	Price 2d.
		1962. No. 2592.	Price 3d.
		1966. No. 1575.	Price 5d.
	Firearms Act 1937		Price 2/6
	,, ,, 1965		Price 1/6
	Air Guns and Shotguns Act 1962		Price 5d.

Criminal Justice Act 1967 Part V (Shot Gun Certificates required from 1st May, 1968, obtainable from Police).

All the above obtainable from H.M. Stationery Office, Kingsway, London W.C.2 and National Environment Research Council, 19 Belgrave Square, London S.W.1. Extra for postage should be included with order.

The R.S.P.B., The Lodge, Sandy, Bedfordshire intends to publish a simplified version of the provisions of the Acts early in 1968 called *Wild Birds and the Law.*

AUTUMN BRYOLOGICAL EXCURSION

MARY DALBY

A joint meeting with the British Bryological Society was held from 2nd–9th September, 1967, based on Northallerton to work the Cleveland Hills and to record some of the grid squares for the mapping scheme.

On Sunday a visit was paid to Gormire where *Ricciocarpus natans* was abundant in both lakes and *Dicranum strictum** and *Mnium rugicum** were the first records for vice-county 62. Climbing up through Garbutt Wood to the scars of Whitstonecliff *Gyroweissia tenuis* and *Seligeria recurvata* were noted fruiting abundantly. Sutton Bank was rich in calcicoles and a forest ride below Roulston Scar produced *Plagiothecium curvifolium** on hawthorn and *Scapania aspera** on scree. *Mielichhoferia elongata*, in its only known English station, was the object of Monday's excursion to Ingleby Greenhow and members were rewarded by finding both this and, growing with it, *Coscinodon cribrosus**, a new County record. *Dicranella subulata**, *Riccardia palmata**, *Discelium nudum* and *Solenostoma sphaerocarpum* were also noted.

On Tuesday Pilmoor, almost the last area of lowland heath remaining in the Vale of York, was visited. Here *Dicranum spurium**, *D. polysetum**, *Odontoschisma denudatum**, *O. sphagni* and *Acrocladium cordifolium* were noted, but the best find of the week was from the disused railway line where Mrs. J. A. Paton found *Fossombronia incurva** new to England. Unfortunately the weather deteriorated in the afternoon and Leckby Carr (V.C. 65) presented an impenetrable jungle of overgrown carr which daunted most members. However, *Riccardia sinuata** from a nearby ditch was a new record.

On Wednesday the party divided, one group going to Arncliff Woods in Eskdale where a number of old records were confirmed, *Harpanthus scutatus**, *Hygrobiella laxifolia** and *Plectocolea paroica** being the most notable. Also here were *Lejeunea cavifolia**, *Calypogeia neesiana var meylanii**, *Radula complanata*, *Plectocolea obovata* and *Scapania umbrosa*. Another group went to Kepwick Hall grounds and the moorland behind where a variety of habitats of old quarries, basic flushes and acid moorland provided an enjoyable day. Ashberry Hill near Rievaulx and the marshy meadows nearby were interesting for a variety of calcicoles when members visited them on Thursday and *Isopterygium seligeri** found in Tup Hag Wood was confirmation of an old record for the vice-county.

The last day was spent in the Osmotherley area, first visiting the Thimbleby Park woods leading up to Oakdale reservoir where a number of interesting species were found both in the woodland and on the old stonework of the reservoir outlet, among them *Priessia quadrata, Trichocolea tomentella, Scapania irrigua* and *Bryum bornholmense**. In the afternoon Scarth Bog, a National Trust property about two miles north of Osmotherley, produced several species of *Sphagna*, *Splachnum ampullaceum*, *Mylia anomala* and *Cephalozia connivens*. Scugdale and Mount Grace Priory were visited by parties on the return journey.

During the week various groups examined stubble fields and waste ground, *Bryum ruderale**, *B. violaceum**, *B. klinggraeffii* and *B. rubens* were noted for V.C. 62; *Anthoceros punctatus** and *Physcomitrella patens** for V.C. 65. *Pellia neesiana** and *Scapania scandica** were also recorded from Spaunton Moor.

A short article permits little more than the new vice-county records when reporting on a week's work, but an impressive number of both common and rare species were found which are of value both to the grid square mapping scheme and to the Y.N.U. records of distribution within the county.

Birds and Wild Africa by **William Condry.** Pp. 192 with 16 pages of illustrations. 1967. Collins. 30/–.

From a base in the sparsely populated northern end of Zambia, the author visited the little known and very wild region that extends down the Western Rift Valley from Lake Tanganyika to the Poroto Mountains north of Lake Nyasa. A great deal has been written about the game animals of East Africa but this book deals with the birds, insects, wild plants and trees in the region where East and Central Africa meet. Mr. Condry has trained his observant eye upon a wilderness which is still very rich in wild life, especially birds. It does not claim to be anything more than a readable book, and in this it succeeds admirably, while the photographs by the author add to the interest and enjoyment of the reader. D.F.W.

AUTUMN FUNGUS FORAY AT RICHMOND

T. F. HERING

About fifteen members attended this Foray which was held from 14th–17th September, 1967, using a workroom kindly provided by St. Francis Xavier's School. Conditions were generally a bit dry and the woodlands at Easby, Aske and Clapgate Gill produced little of note. Grassland was relatively speaking more rewarding. Billy Banks, just outside the town beside the river Swale, was the most fruitful site, with large collections of *Craterellus cornucopioides* and two handsome *Ramarias*, one of them *R. botrytis* and the other a large buff-coloured species which was collected in the same place on the 1956 Foray and remained unnamed. Specimens of this were submitted to Mr. D. A. Reid and provisionally identified as *R. obtusissima* but a firm determination must await further collections and observations. Several members were active with their cameras, and a return visit was made here before the party left. Identifications in the workroom were made harder by the unavoidable absence of some regular attenders. Mr. W. G. Bramley, who has contributed so many of these reports, was unable to attend for the first time in many years.

Y.N.U. AUTUMN FORAY, RICHMOND 1967 — PROVISIONAL FORAY LIST

(A1 = Aske, Black Plantation; A2 = Aske Park; B = Billy Banks;
C = Clapgate Gill; E = Easby)

PHYCOMYCETES
Syzygites sp. on *Amanita rubescens*, A2

ASCOMYCETES
Helvella crispa, B
Leotia lubrica, B
Nectria cinnabarina, E
Rhytisma acerinum, B C
Stigmatea robertiana, C
Geoglossum viride, B
Otidea sp., B
Xylaria polymorpha, E
Xylaria hypoxylon, B
Humaria hemisphaerica, B
Hypoxylon coccineum, A2
Pyronema sp. on burnt wood, B

GASTEROMYCETES
Bovista plumbea, C
Lycoperdon pyriforme, B A2
Phallus impudicus, B
Crucibulum vulgare, E
Scleroderma aurantium, B E

HYMENOMYCETES (other than agarics)
Calocera viscosa, A1 B
C. cornea, B
Clavaria cinerea, B
Ramaria botrytis, B
R. sp. cf. *obtusissima*, B (det. D. A. Reid)
Hydnum repandum, A2 B
H. rufescens, B
Polystictus versicolor, A1
Fomes annosus, A1 B
Thelephora terrestris, A1
Stereum hirsutum, A1; *sanguinolentum*, A1

AGARICS
Amanita fulva, A2; *pantherina*, B; *rubescens*, A2, B; ?*excelsa*, A1
Armillaria mellea, A2 C
Asterophora lycoperdoides, on *Russula nigricans*, B
Bolbitius vitellinus, C
Boletus badius, A2; *chrysenteron*, B; *elegans*, C
Collybia cirrhata, B; *confluens*, A2 B; *maculata*, A1; *peronata*, B
Cantharellus cibarius, *B*; *tubaeformis*, A2 B
Clitopilus prunulus, B
Coprinus atramentarius, C; *plicatilis*, B C
Craterellus cornucopioides, B; *sinuosus*, B
Galerina hypnorum, A1; *mutabilis*, B
Gymnopilus junonius, A2
Hygrophorus chlorophanus, C; *coccineus*, C; *eburneus*, B E; *psittacinus*, C; *uliginosus*, C; *virgineus*, C

Hygrophoropsis aurantiacus, A2
Hypholoma fasciculare, A1 A2 B; *marginata*, A1
Inocybe asterospora, B E; *cookei*, B; *bongardii*, B
Laccaria amethystea, B; *laccata*, B; *proxima*, A1
Lactarius blennius, A2 B; *chrysorrheus*, E; *glyciosmus*, A1; *mitissimus*, B; *pallidus*, E; *piperatus*, B; *pterosporus*, B (det. D. A. Reid); *quietus*, B; *rufus*, A1; *subdulcis*, A2 B; *tabidus*, A1; *turpis*, A1
Macrocystidia cucumis, B
Marasmius androsaceus, A1; *rotula*, B
Mycena galericulata, A1 A2 B; *galopus*, A1 B; *speirea*, A1 B; *fibula*, B
Nolanea cetrata, A1; *staurospora*, C E
Oudemansiella radicata, A2 B
Paxillus involutus, A1 B E
Panaeolus sphinctrinus, C
Pholiota squarrosa, C
Pluteus cervinus, A2
Russula aeruginosa, A2; *atropurpurea*, A2 B; *cyanoxantha*, A2 B; *emetica*, A2 B; *fellea*, A2 B; *foetens*, B; *lauro-cerasi*, B; *mairei*, A2 B; *nigricans*, A2 B; *ochroleuca*, A1 B
Stropharia aeruginosa, A2; *semiglobata*, C
Tricholoma argyraceum, B; *sciodes*, B
Tricholomopsis rutilans, A1

UREDINALES
Coleosporium tussilaginis on *Arctium*
Melampsora sp. (*capreae*?) on *Salix*, E
Puccinia punctata on Cirsium arvense, C; *striiformis* on *Holcus*, A2; *striiformis* on *Agropyron caninum*, B
Trachyspora intrusa on *Alchemilla*, A2

BOOK REVIEWS

Wayside and Woodland Fungi by **W. P. K. Findlay.** Pp. xi + 202, with 59 colour illustrations of fungi by Beatrix Potter, 28 by R. B. Davis, and 20 by E. C. Large, also 19 black and white photographs and 8 line drawings. Frederick Warne. 1967. 65/-.

This is a clearly written handbook to the common macro-fungi found in Britain. Apart from the main body of the book, which consists of plainly-worded descriptions of the various groups, and of some 350 individual species, there is a section on ecology, as well as valuable advice on how to collect fungi, and how to proceed about their identification. The nomenclature is modern, following for the most part the B.M.S. 1960 Check-List. Wherever appropriate, the existence of a specialist monograph is mentioned. Curiously, alone of the now celebrated series published in *The Naturalist*, that by Pearson on *Lactarius* is omitted.

There are simple keys to the different major groups of *Hymenomycetes*, and to the commoner species of eight particularly important genera, namely *Tricholoma, Clitocybe, Mycena, Russula, Lactarius, Boletus, Clavaria* and *Stereum*. This is an excellent idea, but the author has reduced the usefulness of his keys by being rather too frugal in his selection of species. Thus, with regard to the *Lactarius* key, neither *L. quietus, mitissimus,* nor *tabidus* is considered common enough to demand inclusion. Another example is *Clavaria*, where naturalists using the key in this county will soon get into serious difficulty because of the omission of *C. luteo-alba* and *C. acuta*. Here and elsewhere, it must be regretted that not even brief notes are appended of the various species which the author can only narrowly have decided not to require full treatment. These omissions clearly increase the likelihood of the user of the book arriving at the wrong answer.

The coloured illustrations represent only some hundred species, which is not nearly enough, but are nevertheless of special interest. Those by Beatrix Potter are very beautiful, some sublimely so (e.g. *Oudemansiella radicata, Hygrophorus niveus*), and convey the texture of the subjects marvellously well, although one suspects that a few (e.g. *Boletus piperatus*), have suffered from the loss of subtle nuances of colouring in the course of reproduction. Equally fine, though of quite different style, are those by R. B. Davis. Those by E. C. Large are different again, and of their kind entirely acceptable, but it was surely a mistake to place some of these paintings on pages facing Beatrix Potter illustrations, for the two styles are not compatible. The delicacy of the Potter paintings makes the stronger line of those produced by Large seem coarse and clumsy (cf. Plates 22 and 23).

The publication of a popular general work on the identification of fungi is a rare event in this country. Indeed, had this book been published a few years ago, as recently as 1962, it would have had the field to itself, for Wakefield and Dennis's *Common British Fungi*, a work of quite comparable character, has been out of print for many years and is now only rarely obtainable and commands an astonishingly high price. However, in 1963 the Collins *Guide to Mushrooms and Toadstools*, by Morten Lange and Hora, was published, and in this instance comparisons are not so much odious as necessary and significant. Both this work and the one under review are books of notable quality by authors of distinction, Dr. Hora being one of our most expert agaricologists, and Dr. Findlay a mycologist of great experience. Lange and Hora is constructed around coloured illustrations of some 580 species, taken for the most part from Jakob Lange's magnificent *Flora Agaricina Danica*, with accompanying condensed descriptions. Findlay provides an expansive text, with relatively discursive descriptions of some 350 species, accompanied by coloured figures of only some 100 species. Thus in character the two books are very different, so different as to be complementary to each other. But most beginners want to acquire only one work in the first instance, and there is an important difference in price. There is no doubt in my mind that Findlay (65/-) is not twice as good a book as Lange and Hora (30/-). Nevertheless, enthusiasts for the macro-fungi who already possess Lange and Hora will find this new entry a costly but useful acquisition, providing as it does a quite different and complementary approach. And there are the Beatrix Potter paintings.

J.D.L.

Great Waters by **Sir Alister Hardy.** Pp. 542 with numerous plates and figures. Collins. 1967. 63/-.

Sir Alister Hardy's two volumes in the *New Naturalist* series, *The Open Seas*, were justifiably successful not only in popularising marine science but also in bringing together for students and other biologists the many facets of this complex subject. This lengthy book inevitably touches on some of the subject matter of *The Open Seas* but is primarily a personal account of the voyages of the research vessel *Discovery* in 1925–7 with special reference to the whales and plankton of Antarctic waters. The author's personal diary provides the narrative theme around which is woven an immense amount of information relating to the history and methods of the whaling industry, the methods of oceanographic research, and the complex interrelationship between the physical environment and the biology of the whales and the planktonic animals on which they feed. The findings of later surveys are also included and related to the earlier results and ideas, and the author must be congratulated on presenting in such readable form, so much of the information that is otherwise available only in the 33 large and technical volumes of Discovery Reports.

No reader will fail to be impressed by the tragic contrast between the immense physical and mental effort expended by the scientists and crews of the research vessels in trying to arrive at an understanding of the biology of whales and the equally hard and ingenious efforts devoted to achieving what in effect is the near-extermination of these animals. Only now when commercial catches are declining rapidly does it appear that attention will be paid to the scientific view that internationally controlled whaling could both preserve these animals and still provide a worthwhile yield.

In such a beautifully illustrated book so full of unexpected information about many aspects of Antarctica one regrets finding occasional whimsical passages that must surely offend both scientific and lay readers. More serious is the fact that the personal diary extracts tend to be too numerous and repetitive and make the book too long. Although those relating to the scientific programme have value in illustrating the tedium and lack of glamour in such research, the lists of animals taken on the outward voyage and having little or no relevance to the main theme of the book could profitably have been omitted as could lengthy extracts dealing with, for example, the vegetation of oceanic islands or the ceremony of crossing the equator. In spite of these reservations, however, one cannot do other than recommend such an interesting book.

J.R.L.

The New Zealand Sea Shore by **John Morton** and **Michael Miller.** Pp. 638, with 32 plates and 220 figures. Collins. 1968. 84/-.

Few of us who knew this book was being written could have anticipated it would prove to be such a comprehensive and magnificently produced volume. The number, clarity and quality of the line drawings, and of the black and white and colour plates are such that it is a pleasure to handle and own this book, and the publishers are to be congratulated on the selling price which must be regarded as low in relation to the probably limited sales this volume will have outside Australasia and scientific libraries.

By selecting the major types of marine habitats on rock and soft bottoms and describing the plants and animals therein, before dealing with the distribution of the various combinations of species that occur together in particular regions of New Zealand, the authors have achieved an unusual combination of functional morphology and conventional littoral ecology, with many of the illustrations serving for identification purposes. Much of the detail can have little relevance for European readers other than to emphasise the comparative poverty of our own littoral fauna, to illustrate that the same general principles control distribution and zonation in New Zealand as here, and to make us aware of how much has been achieved so quickly by comparatively few New Zealand biologists. J.R.L.

Sharks, Skates and Rays. Edited by **Perry W. Gilbert, Robert F. Mathewson** and **David P. Rall.** Pp. 624 with 256 figures and numerous tables in the text. Johns Hopkins Press; London, Oxford University Press. 1968. £7 2s. 6d. net.

If this book were to be ordered purely by title the purchaser might expect to receive a general treatise on these fish so it must be emphasised that this is actually a Symposium, with the advantages and limitations inherent in such publications; and it might be at least a kindness on the part of the editors of similar works to indicate their nature more clearly. As is normal in symposia the coverage of the subject can only be determined by a perusal of the titles of the articles, and the articles themselves vary greatly in scope, length and quality; but this is to describe the book under review and certainly not to denigrate it, since it contains much of the greatest interest to all professional workers on elasmobranchs. There is an excellent, succinct account of the evolution of the elasmobranchs by Bobb Schaeffer, who points out also how this ostensibly primitive group has more than kept pace so that the modern forms appear to be the most successful of their kind; a very different but stimulating discussion of electric organs is given by Grundfest; and Chieffi gives a very useful account of the reproductive system. There is no article on repellents, perhaps here also the sharks are keeping ahead, but shorter articles on social organisation, water regulation, respiration and so on give helpful accounts of modern work. But this is necessarily a personal choice, no reviewer could presume to assess all the variegated topics included; this book, therefore, should be available in all the appropriate libraries where those interested in the group can select the articles bearing upon their own research. T.K.

Functional design in fishes by **R. McN. Alexander.** Pp. 160 with 16 text figures. Hutchinson University Library, 1967. Paperback 10/6, Hardback 25/-.

Anatomy and function may be the two sides of one coin but most discussions about animals show a strong bias towards the one or the other, so it is a pleasure to welcome a book in which the author has attempted and achieved a happy balance between the two. In turn this requires some consideration of the physical principles involved in the performance of the functions and such have been skilfully introduced to illuminate, rather than obliterate, the zoological aspects. In his Preface the author mentions that he has selected topics of particular interest to himself but this makes for interesting reading and few readers will fail to find interesting chapters in this book — with the proviso that the fascinating fish depicted on the cover does not appear in the text.
T.K.

Thorburn's Birds, edited with an introduction and new text by **James Fisher.** 82 coloured plates by Archibald Thorburn; two end paper maps. Ebury Press and Michael Joseph. London, 1967. 50/–.

It is now over fifty years since Archibald Thorburn's great four-volume *British Birds* with its 82 coloured plates first thrilled an earlier generation of birdwatchers. He was certainly the best British bird artist of the nineteenth century and he portrayed his subjects living in their natural niches, as we can see from the deftest of environmental hints. In the mind's eye of many a schoolboy who was brought up on these volumes, the ideal Golden Eagle forever snatches a blood-stained mountain hare from an icy mountain-side (plate 32) whilst the Osprey rips the flesh from the fish at the side of the loch (plate 33). The plates are notable not only for their high scientific accuracy and exactness of detail but also for their distinction as works of art and the volumes are now regarded as collector's pieces.

In this new single-volume edition all the plates, reduced from the original quarto to about 9″ × 7″, are available between one pair of covers and have been very faithfully reproduced. James Fisher's new text begins with a biographical introduction and a list of all the works, and they are legion, in which Thorburn's pictures have appeared. The plates have been rearranged to follow Fisher and Peterson's 1964 classification and the short text, which appears on the page opposite to the illustration for each species, deals with its status and history in Britain, its probable origins and its world distribution. Species added since Thorburn's day are given a text in the appropriate places marked 'not illustrated' and the 'Hastings rarities' are retained in square brackets. The text is up-to-date and special mention is made of changes and conservation problems. For a book of this quality the price is reasonable and those glorious plates will thrill a younger generation of birdwatchers just as they thrilled their grandfathers fifty years ago. D.F.W.

Neeka the Kestrel by **David Rook.** Pp. 65 with 40 charcoal drawings by the author. Vernon & Yates. 1967. 25/–.

This volume describes the author's first adventures in the art of falconry, experimenting with a Lesser Kestrel 'taken' as a fledgling from the battlements of an ancient Spanish castle.

David Rook is already well known as the illustrator of Joyce Stranger's best selling novel *The Running Foxes,* and here he again displays his obvious artistic talent with a series of forty sensitive charcoal drawings. Unfortunately, the text shows a disturbing eagerness in urging others to follow his example of depriving young birds of prey of their freedom. An appeal in the closing paragraph for the conservation of wild life would appear rather hypocritical in view of his statement that he intends to pay a further visit to Spain to obtain another bird as a companion for 'Neeka'.

The keen falconer will learn little from this book; the bird lover and conservationist should be dismayed by some of the attitudes adopted. T.G.G.

Owl. The House Magazine of The Three Owls Bird Sanctuary.

During the past three years, with enlightened help from the County Borough authority, Mrs. Eileen Watkinson has established a bird hospital with aviaries in Oldham's public Alexandra Park. The nursing and feeding of up to 150 birds, together with general maintenance of Three Owls Sanctuary obviously makes a great demand on available resources.

One way in which naturalists can support this project is by subscribing to a new bi-monthly magazine *Owl,* the first issue of which appeared on 1st March, 1968. In doing so, they will also find much of interest in its twelve pages. The present issue contains articles on 'The Trade in Birds of Prey' by K. G. Spencer (which all protectionists should read) and on 'Chaffinches' by John Armitage.

Single issues at 2/– or a year's issues at 12/– (post free), may be ordered from Owl Magazine, The Three Owls Sanctuary, 19 Queen's Road, Oldham, Lancs.

World Vegetation by **D. Riley** and **A. Young.** Pp. 96 with 122 photographs, 4 colour plates and one map. Cambridge University Press. 1968. 15/–.

The original edition was published in 1966 and was reviewed in *The Naturalist* 68, 1967. This is a hardback reprint. The book surveys the major world vegetation types and their relation to climatic and soil conditions and is notable for the quantity and uniformly high quality of the photographs.

Debate about the Earth: Approach to Geophysics through Analysis of Continental Drift by **H. Takeuchi, S. Uyeda** and **H. Kanamori.** Pp. 253 with 120 figures and 4 tables. Freeman, Cooper and Co., San Francisco. 1967.

Of late years there has been a revival of interest in the Continental Drift theory. Modern techniques in geophysics and various branches of earth science such as rock magnetism and oceanography have yielded data highly relevant to the concept of shifting continents. The purpose of this book is to present the case for and against the theory in the light of recent findings bearing upon it.

The book grew out of a television programme which was amplified for publication in Japan and which has now been further expanded and translated. Much of the data pertinent to the drift hypothesis is technical to a degree beyond the comprehension of the non-specialist reader and the skilful and effective way in which this is presented in a manner which is not merely intelligible but absorbing and stimulating deserves the highest praise. Ever since Wegener first advanced the theory of continental drift, plant and animal geographers, for whom it explains so many otherwise intractable problems, have been predisposed in its favour. The recent rehabilitation of the theory is a matter which is of the greatest interest to them and this book will be of particular value to biologists for the understanding which it provides of a complex subject the resolution of which has such an important bearing on their own studies. W.A.S.

Caddis Larvae by **Norman Hickin.** Pp. 476 with 980 illustrations in the text. Hutchinson. 1967. £10 10s. net.

This book is the outcome of thirty years of intensive study of caddis fly larvae by Dr. Hickin. Rather less than 200 species of caddis are known from Britain and of these 82 are described in detail from British specimens and many more from European sources. There are four chapters on the general biology of Trichoptera, one on technical details of preserving, rearing, etc., and one on each of the 14 families on the British list. These last are gems of precision treatment, each one contains a check list of native species, a general description of larvae, a detailed description, where possible, of individual species, a key and a bibliography.

One cannot but admire the high class of this book, its orderly arrangement, its numerous first-rate drawings, in fact its professional competence combined with a sort of amateur enthusiasm which makes it a pleasure to use and to read. Every 'Trichopterist' and fresh water biologist will have to buy or borrow it and no doubt it will inspire many to become devotees of the group if they are not already so.

If criticism there must be it is already recognised by the author to lie in a certain lack of precision nomenclature in detailed descriptions. This is a common state of affairs in many fields of entomology and one not likely to be resolved for a long time yet. One may also regret the very high price, but the quality of production and wealth of illustration presumably dictate this. The thanks of all entomologists should go to Dr. Hickin and his colleagues on Rentokil for making his hard-won knowledge available, even if at a daunting price. H.H.

A Key to the Adults and Nymphs of the British Stoneflies (Plecoptera) with notes on their ecology and distribution by **H. B. Hynes.** Pp. 91. Freshwater Biological Association, Scientific Publication No. 17. Second revised edition, 1967. 6/-.

This excellent handbook replaces the edition of 1957. There are a few alterations to the text and figures and the distribution maps have been revised. The distribution maps are on the vice-county system and might be regarded as an invitation to entomologists to fill some of the gaps. J.H.F.

Your Book of Freshwater Life by **John Clegg.** Pp. 55 with one coloured and 12 black and white plates. Faber. 1968. 15/-.

An attractively presented and admirable introduction to pond life, suitable for the eleven to thirteen-year-old. Here are illustrated and succinctly described representatives of most of the familiar animals, and a few of the microscopic plants, that the young pond-hunter will find. The book is completed by suitable instructions on easily acquired collecting equipment, what to do, sensible advice on joining a natural history society and a suitable guide to further reading. It must be said, however, that some of the photographs are not so clear and the price is rather high. J.H.F.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

Annual subscription — 35s. post free

Write for specimen copy to F. W. Byers, 59 Gurney Court Road, St. Albans, Herts., enclosing 5/–. This amount will be taken into account in the first year's subscription.

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R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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ORNITHOLOGICAL SECTION

Preliminary Notice: In conjunction with Bradford Naturalists' Society, the Ornithological Section is arranging a public film show to take place on Friday, 8th November, 1968 at 7.30 p.m. in Victoria Hall, Saltaire.

A colour film entitled 'Norfolk Bird Life through the Seasons' will be shown. The film has been produced by Mr. R. P. Bagnall-Oakley who will be giving a live commentary.

Harrogate and District Naturalists' Society, in conjunction with the R.S.P.B., is sponsoring a showing of R.S.P.B. films at the Royal Hall, Harrogate on 27th November. The capacity of the Hall is 1,300 so it is hoped that other societies and individual members will make this event widely known.

Would members please note that records for Vice-County 63 should now be sent to C. Bower, 17 Woodland Rise, Silkstone Common, Nr. Barnsley, who has succeeded J. Cudworth as Ornithological Recorder for that area.

The R.S.P.B. requests that anyone who discovers any bodies of oiled seabirds report the matter to them. Forms for reporting these are available from the R.S.P.B. at The Lodge, Sandy, Beds.

Members who have not paid their subscription for 1968 are requested to forward same to the Assistant Treasurer, Mr. G. A. Shaw, without delay.

Annual Subscription 30/- (post free) payable in advance to The Yorkshire Naturalists' Union, The University, Leeds 2.

BRITISH MUSEUM
16 JUL 1968
NATURAL HISTORY

MODERN NATURAL HISTORY

G. C. VARLEY
Hope Department of Zoology (Entomology), Oxford.

Presidential Address to the Yorkshire Naturalists' Union, Barnsley, 2nd December, 1967.

I am very conscious of the honour you have done me by electing me as your President because the Y.N.U. has such strong connections with many distinguished amateur naturalists whose work and enthusiasm have been an inspiration to many including myself.

As a boy I was a frequent visitor to the Tolson Memorial Museum in Huddersfield. There I met Dr. Woodhead and received a lot of encouragement from that great naturalist Ben Morley. He had a very wide knowledge of the local insects and kindly directed me to many delightful collecting areas and helped me especially with the Microlepidoptera. In 1953 I was with a party of members of the British Ecological Society who were lucky enough to be shown some of the country round Malham by that veteran Yorkshireman Chris Cheetham. However, there is no doubt that for me the most influential member of the Y.N.U. has been Douglas Hincks. His biggest impact on entomology came with the publication of the Kloet and Hincks *Check list of British Insects*, published in Stockport in 1947. The Royal Entomological Society of London has recognised its value and is organizing the publication of a revision; the Y.N.U. should be justly proud that the names of these two amateurs will still appear on the revised list.

This revised edition is proving difficult to prepare because we still do not agree how to define a species, and modern definitions are hard to apply. We still do not know what insect species are present even in well worked parts of the country.

An illustration of this arose during a walk in Blenheim Park with my children in 1964. There we found on the blades of the common grass *Brachypodium pinnatum* some white fluffy waxy objects half an inch long which proved to be the ovisacs of scale insects (Fig. 1). Afterwards I found the same scale insects were locally abundant on Rough Common at Wytham, just over the county boundary in Berkshire. As these scale insects proved to be attacked by interesting predators and parasites I collected some hundreds and used them in the Oxford Zoology course to illustrate the principles of biological control of pests. Identification of the insects has proved difficult and all we can be quite sure of is that the scale insect is a species of *Eriopeltis*, but not the one on the British list, and that the predatory fly larva is a species of *Leucopis* which is also new to Britain.

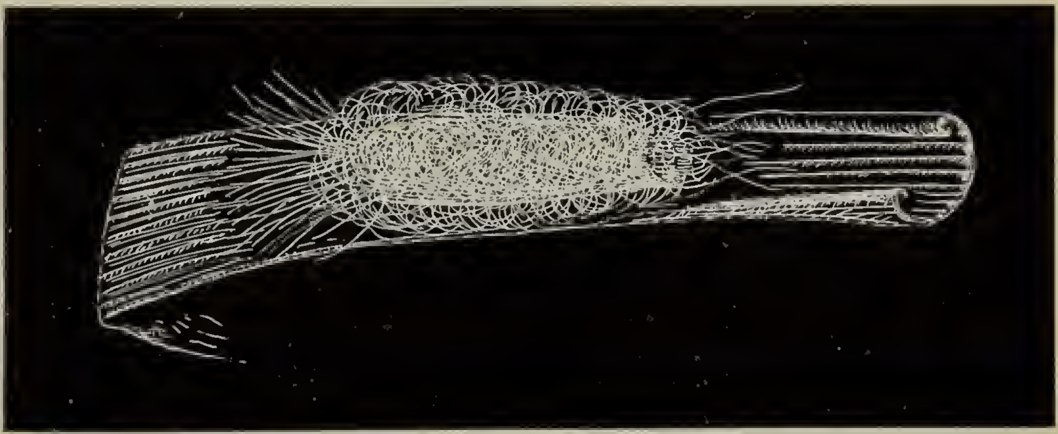

Fig. 1. The white waxy ovisac of the scale insect *Eriopeltis ? strelkovi* Borchs. on a blade of the grass *Brachypodium pinnatum*, in winter.

The ease with which discoveries can be made applies not only to small and obscure insects which are neglected by most amateurs. Even the moths, so assiduously studied by many keen collectors, present many problems of identification and we still know remarkably little about how they live. Few collectors realise that the males of many common moths have complex scent brushes, some of which I described in 1962.

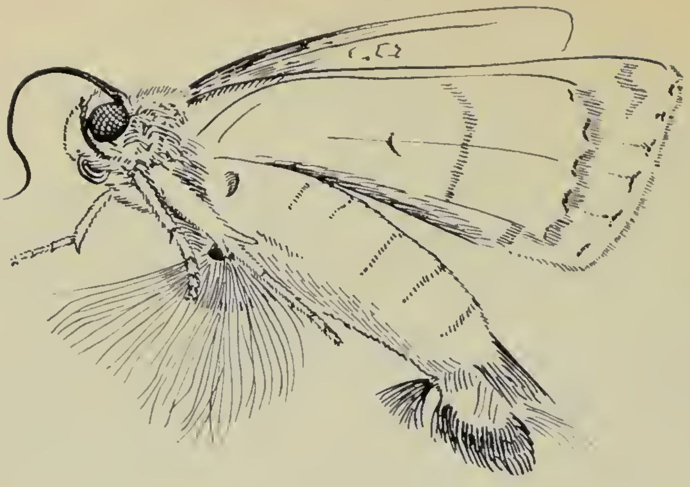

Fig. 2. Dark Arches moth (*Apamea monoglypha* (Hafn.)) inflated to show the big scent brush at the base of the abdomen and the smaller ventral brush in front of the genitalia of the male.

The abundant Dark Arches moth (*Apamea monoglypha*) (Fig. 2) has a pair of large scent brushes which are normally hidden in pouches on either side of the body. Although the brush can be dug out with a pin, it is often simpler if the moth is pierced with a hypodermic needle and inflated. It can be dried in the expanded position as in the figure. Few entomologists have ever observed these brushes in action but Aplin and Birch (1968) have found that the aroma of almonds from the brushes of some of the wainscot moths (*Leucania* spp.) is associated with the presence of benzaldehyde.

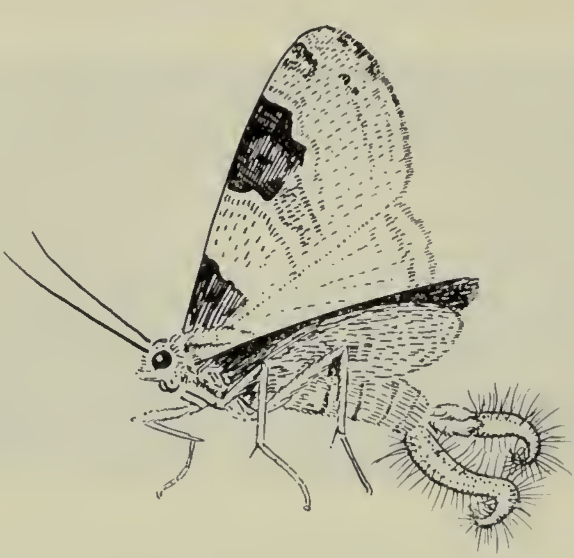

Fig. 3. Garden Carpet moth (*Xanthorhoe fluctuata* (L.)) inflated to show large terminal coremata in the male.

Many male geometers, like the Garden Carpet (*Xanthorhoe fluctuata*) (Fig. 3) have beautiful brushes at the hind end of the body which have no smell that I can detect. These organs seem to be inflated by the male when first the female is touched, but observations of this kind have yet to be made for the majority of species in which such organs are known to be present. Here is a good chance for the careful amateur to make entirely new observations and have a great deal of fun trying to find how these strange structures are employed in the moth's courtship. Many British insects also have special glands which produce distasteful substances, as in many of the tiger moths (Fig. 4). The reactions of birds and other insect-eating animals to these have scarcely been studied at all. Tame birds, domestic cats or mice react to different insects in a way that reveals that many of our gaudy insects are rejected.

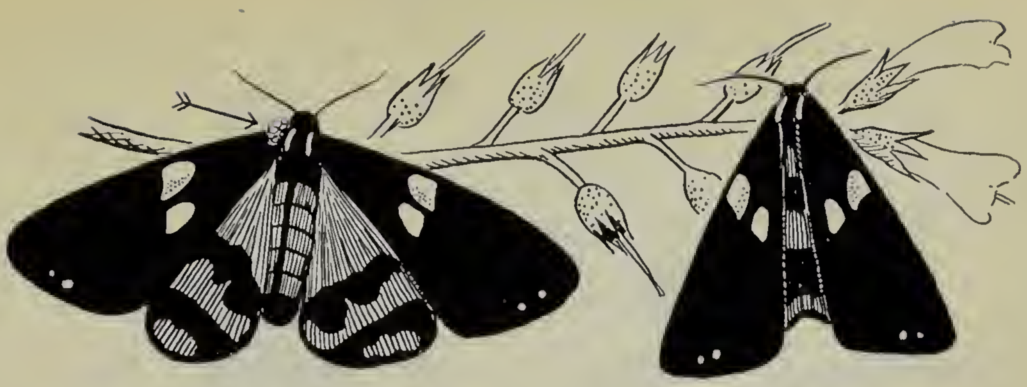

Fig. 4. Scarlet tiger moth (*Panaxia dominula* (L.)). At rest (*right*) and displaying after disturbance (*left*). Note arrow pointing to brown frothy secretion.

The amateur lepidopterist can help with the nationwide distribution study which is being organised by the Nature Conservancy and the British Trust for Entomology. Any of you interested to help should get in touch with Mr. Heath at the Biological Records Centre, Monks Wood Experimental Station, Abbots Ripton, Hunts., or your county representative.

Another useful thing which amateurs can assist with is the recording of migrant insects which is organised by Mr. French at Rothamstead Experimental Station, Harpenden, Herts.

Nature photography has become very much easier of recent years with single lens reflex cameras which permit close-up pictures of plants and animals. This enables the modern naturalist to record interesting events in colour and of course simplifies the giving of a talk such as this. However, I must interject a word of warning here. Not only have bird photographers unwittingly exposed their subjects to unusual risk by making paths to the nests, or by keeping the parent birds away from the nest for too long, but the photographers of rare plants have often damaged by trampling many non-flowering orchid plants in their efforts to photograph a prime specimen. Preservation of our rare orchids, of which Yorkshire has its fair share, is a difficult problem because many are conspicuous and may be picked by the ignorant simply for their beauty or picked for preservation by the over-ardent collector. To keep secret the locality of a rarity may be unwise if the area is in danger of destruction. This destruction might be avoidable if the facts were known. Yet the knowledge of the facts by the wrong people can in itself be a danger. We must seek by our own example to give the younger generation of naturalists a properly responsible attitude to these matters.

The scope of modern natural history where the amateur can make his mark is still vast, because although the life-histories of over half the British insects may be known in outline or by inference, the lives of less than a tenth are known in any detail. It is easy to stumble on something quite new, as I did as a student in Cambridge by pulling up the roots of the reedgrass (*Glyceria maxima*) from beside the river Cam. There I found what I was seeking — the larvae of the beetle *Donacia* (Fig. 5: 2) which get their oxygen by piercing the plant roots. At the same time I stumbled on what is, I think, a very remarkable example of convergent evolution — the adaptation of different un-related insects to the same specialised role. In Cambridge I found and described (1937) the larvae of the hover-fly *Chrysogaster hirtella* (Fig. 5: 9, 10 & 11) which has the openings of the breathing system on the sides of a single dagger-like spiracle with which it pierces the air spaces of plant roots. When fully grown in spring the larva leaves the mud and pupates above water level. The larva of the small Ephydrid fly *Notiphila riparia* has a pair of daggers at the hind end on which the spiracles open (Fig. 5: 13). The larva forms its brown puparium in spring whilst firmly attached to a root (Fig. 5: 14). Years later, near Oxford, I searched again amongst the reedgrass roots and found a third kind of fly larva, that of the small cranefly *Erioptera squalida* which at first sight seemed not to be adapted in any special way. When, under pressure, the hind spiracles were extruded they too were sharp and it is very probable that these larvae also pierce the roots. When they pupate, the main spiracles are on

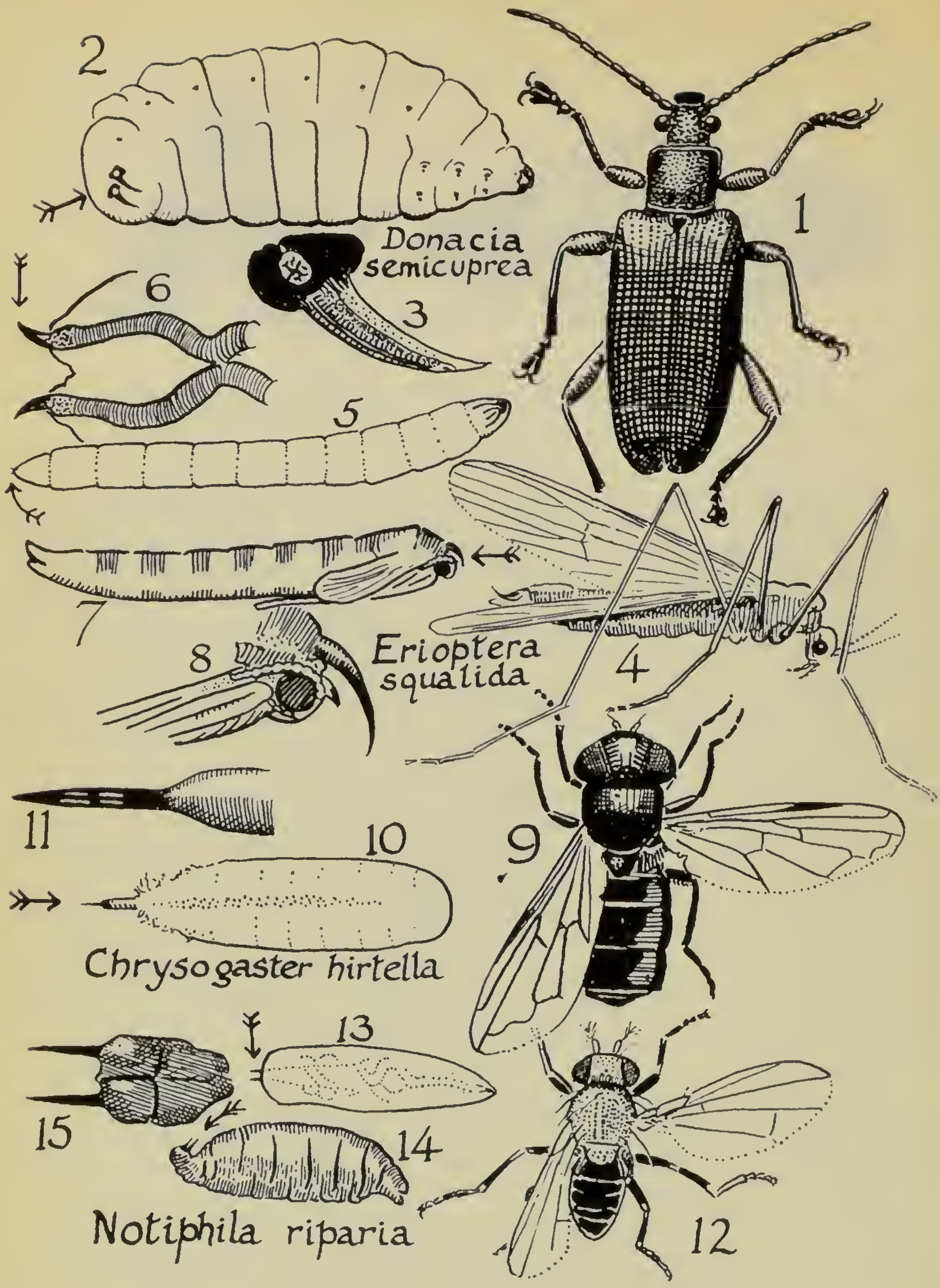

Fig. 5. Insects whose larvae or pupae live in de-oxygenated mud and get their oxygen from roots of the grass *Glyceria maxima*.

Donacia semicuprea Panz. (Chrysomelidae) 1, adult beetle; 2, larva with hind spiracles like daggers; 3, detail of larval hind spiracle.
Erioptera squalida Loew. (Tipulidae) 4, adult fly; 5, larva; 6, detail of larval hind spiracles; 7, pupa with spiracular daggers; 8, detail of pupal prothoracic spiracle.
Chrysogaster hirtella Loew (Syrphidae) 9, adult hover fly; 10, larva; 11, detail of larval hind spiracle.
Notiphila riparia Mg. (Ephydridae) 12, adult fly; 13, larva; 14, puparium; 15, detail of paired hind spiracular daggers.

the prothorax and are in the form of long daggers. The head and prothorax can nod actively and thus thrust the daggers into a root. How the fly eventually emerges from the mud has not been observed.

My present work in Oxford concerns the populations of defoliating caterpillars on oaks, especially the winter moth. This and the many other species of caterpillars present are often parasitised by tachinid flies or by various parasitic Hymenoptera. The life histories of these parasites have fascinated me ever since my student days because of their bewildering variety. Collectors of caterpillars are familiar with the idea that adult parasites sting their hosts and lay eggs in them or on them. One of the commonest parasites of winter moth (*Operophtera brumata*) is the tachinid fly *Cyzenis albicans* which adopts another method to infect the host. The eggs are very small — only 0.2 mm. in length — and are deposited on the underside of a leaf close to where a winter moth larva has been feeding. The egg contains a maggot ready to hatch and, if it is swallowed whole, the tiny maggot hatches in the caterpillar's gut, bores into its body, and enters a labial gland cell. The winter moth caterpillar finishes feeding, and not until it is a pupa in its underground cocoon does the parasite maggot finally destroy it. Although probably all of the many oak-feeding caterpillars swallow these eggs under natural conditions, *Cyzenis* larvae fail to develop in almost all of them. Experimentally we have reared it from the Northern Winter moth, *O.fagata*, by putting the eggs on its food. We still know very little about the host range of these parasitic insects. For perhaps half of the British species no host is yet known. Here is another field of study in which amateur collectors may give valuable service, by carefully retaining, mounting and labelling any parasitic species reared. To be useful, all the host remains and the parasite cocoon or puparium should be kept together with the emerged adult. In Oxford, with help from many quarters, we are slowly building up our collection of reared parasites which will eventually be a valuable source of breeding records.

Such a collection also provides information about the structure of the larvae of these parasites. From the cocoon of an ichneumon fly the cast skin of the larva can be removed and prepared for microscopic examination: similarly the puparium of a parasitic tachinid fly incorporates all the important external structures of the larva such as the spiracles and the mouth parts. Curiously enough the structural differences between these larval stages are often easier to appreciate than differences in adult structure and they provide a remarkably good guide to the classification of the adults. What is more, they reveal more clearly than other evidence those cases where species have been incorrectly placed in the classification.

The modern naturalist can contribute enormously to the sum of useful human knowledge by his or her observations. I am confident that the present members will continue to maintain and indeed enhance the high reputation of the Y.N.U. in this respect. We all get very great satisfaction in making new discoveries, however small. My final word is to exhort you to put more effort into the rather more difficult task of communicating your discoveries to others through the medium of publication.

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Knaresborough Ringing Station, Report for 1967, edited by **J. R. Mather** and obtainable from him at 44 Aspin Lane, Knaresborough at 2/6 per copy.

This is not merely a systematic list of the species recorded and ringed in the area covered by this very active group. There is also a detailed account of the passage of warblers through the area. One section describes how the ringing group exploited a temporary glut of birds attracted by uncut barley. Bird ectoparasites collected in the course of their work are listed. Throughout is ample evidence of intensive study of birds in the hand, as opposed to 'ring and sling' techniques and it is pleasing to note that educational use has been made of the station's activities. A commendable report on which the Knaresborough ringing station committee are to be congratulated.

MARINE FISHES AT SCARBOROUGH

D. E. Whittaker

During January, February and March 1968, I have collected many specimens from the local keel-boats, including one species new to the Yorkshire list. All the important specimens are preserved at Scarborough, either in my own collection, or as a duplicate in a collection at the Wood End Museum.

The most interesting specimen is a small shark, known as the Smooth Hound (*Mustelus mustelus* (Linn.)) that was trawled by the *Onward Star* on 19th February. The *Handbook of Yorkshire Vertebrata* gives no definite records for this species but simply states that it is said to occur in the bays of Bridlington and Scarborough. The late W. J. Clarke never saw a specimen of this species at Scarborough, although he studied the fishes here for almost sixty years. The Smooth Hound is very similar to the common Tope. The chief distinguishing feature lies in the form of the teeth, which in the former are very low and smooth, while those of the Tope are distinctly pointed with very sharp cutting edges.

On 24th February I was given a specimen of the Sea Lamprey (*Petromyzon marinus* Linn.) 31″ long which had been found trapped near the propeller of the pilot-coble, moored in Scarborough harbour. This species is now comparatively rare in the North Sea, and very few of the local fishermen had ever seen a specimen. Mr. Clarke notes that the majority of Tunny that he saw landed at Scarborough bore evidence of attacks by the Sea Lamprey, and that they are probably more common that we would believe. The Tunny however is a seasonal visitor to our waters, and hence the majority of scars will have been caused by attacks outside the North Sea.

While searching through a large amount of cod-end rubbish from one of the local keel-boats on 28th February, I came across a small fish about 7″ long, which proved to be an example of the Norway Pout (*Gadus esmarkii,* Nilsson), an addition to the Yorkshire list, but a species which is abundant in some areas in the North Sea.

Other rarely-seen fish that I have received are as follows:

Red Sea Bream (*Pagellus centrodontus* (De la Roche)), one specimen trawled about 10 miles E.N.E. of Scarborough by the *Sincere* on 18th January.

Twaite Shad (*Alosa finta* (Cuviar)), one perfect specimen trawled by the *Onward Star* on 1st February. This giant member of the herring family is known to the local fishermen as the 'Rock Herring'.

Lesser Fork-beard (*Raniceps raninus* (Linn.)), one specimen trawled about two miles off Flamborough Head on 8th February by the *Utilise.*

Common Topknot (*Zeugopterus punctatus* (Bloch)), two specimens, one on 2nd February and the second on 9th February, both trawled by *Our Margaret.*

More usual specimens that have been trawled during the past three months are:

Lesser Spotted Dogfish (*Scyliorhinus caniculus* (Linn.)), one, trawled by *Onward Star* on 16th January. One caught on long-line 29th January. One trawled on 31st January by the *Onward Star* was tagged with a plastic marker and released at Scarborough on 16th February.

Pogge (*Agonus cataphractus* (Linn.)), two specimens trawled by the *F. & S. Colling* and the *Onward Star* on 10th January and 1st March respectively.

John Dory (*Zeus faber* Linn.), one on 5th January by the *F. & S. Colling,* one on 19th February by the *Onward Star,* and the last trawled off Robin Hood's Bay on 20th February by the *Sincere.*

The approach of the breeding season of the Lumpsucker (*Cyclopterus lumpus,* Linn.) was well marked by the movement and consequently frequent capture of specimens by the local boats, some quite large specimens being taken:

16 January	One male 13½″ long, 3 lb. 12 oz. in weight, by the *Onward Star.*
17 January	One male 18″ long, 11 lb. 6 oz. in weight, by the *Progressive.*
19 January	One male, one female, by *F. & S. Colling.*
29 January	One female about 12″ long, by the *Sincere.*
31 January	One male, by the *Onward Star.*
1 February	One small female, by the *Onward Star.*
2 February	One female, again by the *Onward Star.*
8 February	One female 12″ long, off Flamborough, by the *Success.*
12 February	Three, including two males from the *Onward Star.* A fourth specimen, a female, was caught by the *Progressive.*
13 February	One very large female, approximately 22″ long, from the *Onward Star.*

THE AUTUMN MIGRATION OF WADERS THROUGH THE INNER RIBBLE MARSHES, LANCASHIRE

M. E. GREENHALGH

The Inner Ribble Marshes, Lancashire are situated along the Ribble estuary between Preston and Freckleton, a length of about four miles. Here the estuary channel is narrow, being only about 200 yards wide at its widest point in the west. The area on the north side where this study was made includes two saltmarshes, extensive low-lying alluvial fields behind the river embankment and Freckleton sewage farm.

Between 1963 and 1966 I made weekly visits to this area and in 1967 attempted a close coverage of between two and five days each week. On each visit the same area was covered. Intense observation was maintained from late June to November although odd weeks were missed in the years 1963–6. During each visit a full count was made of all the waders present in the study area. In 1967 I was able to supplement my counts with those made by my brother, P. A. Greenhalgh, in the same area.

Several facts emerged from this study. The time of day has a great effect on the wader numbers in an area: they may spend the night at one site, some leaving for another in the early morning and spreading through the estuary as the day progresses. As dusk falls they may return to the previous night's site. Tidal rhythm also affects wader distribution in the estuary. At low tide some waders left the study area and would not be counted. Also, at very high tides when the outer marshes not included in the study were completely covered, the waders were driven off and some came into the study area. In this latter case the count would be high, not necessarily due to real migration, but to local movement. One must be cautious therefore when dealing with wader counts in discerning between true migrations and local movements due to tidal, diurnal or other causes. In 1967 disturbance factors and variation in numbers due to tide, weather and time of observation were noted.

REGULAR AUTUMN MIGRANTS

Three species which breed in and around the study area will not be dealt with as a study of them is not completed. These are the Oystercatcher (*Haematopus ostralegus*), Lapwing (*Vanellus vanellus*) and Curlew (*Numenius arquata*). In this section I will deal with thirteen species which are regular passage migrants in autumn through this area.

RINGED PLOVER (*Charadrius hiaticula*).

Ringed Plovers begin passing through the area in mid-July and their numbers show two short well-defined peaks, one falling in late July to early August and the other in early September (figure 1). Since 1963 the observed peaks have varied between 40 and 100 and in some years the two have been of similar size (e.g. as in 1967) but in other years the second peaks have been lower.

The reason for these two peaks is obscure. Possibly the earlier peak is that of the passage of British and near European stock whilst the second consists of the arctic populations. This is suggested by ringing data and by observations on the breeding populations and migrants in other areas. Witherby *et al.* (1943) stated that only a few breeding birds remain in their nesting grounds after mid-July whilst many in northern areas move south before late August. Birds from the continent pass through Britain from August onwards.

More recent data from ringing has enabled the migrations of Ringed Plover through Britain to be more clearly defined. Bannerman (1961) noted that the nominate race (*C. hiaticula hiaticula*) which breeds as far north as Greenland, Iceland and Scandinavia leaves the breeding sites in July and August wintering south to the Mediterranean. He also noted that the arctic race (*C. hiaticula tundrae*) has a peak passage through Britain in late August and the first three weeks of September.

It is difficult to interpret some ringing data as many birds are ringed on migration, not on their breeding grounds, and measurements which could indicate racial affinities are rarely taken. However, the following two recoveries indicate the probable pattern. The first is of the nominate race which forms the first peak and which also winters in Britain, whilst the second is a recovery of the arctic race: Ringed 11/6/63 Frisian Islands, Germany; Recovered 17/8/63 in Lincoln. Ringed 21/8/58 Lincoln; Recovered 15/7/62 in Murmansk, U.S.S.R. (Data from Spencer, 1963 and Hudson, 1964).

It is also possible in some cases to identify the arctic race and very dark brown birds which I have seen in the second peak were probably *tundrae*. On 23 August, 1967 I found a Ringed Plover dead in the study area with a wing of 123 mm., a tarsus of 24 mm. and bill (from feathers) of 13.5 mm. This was probably an arctic bird.

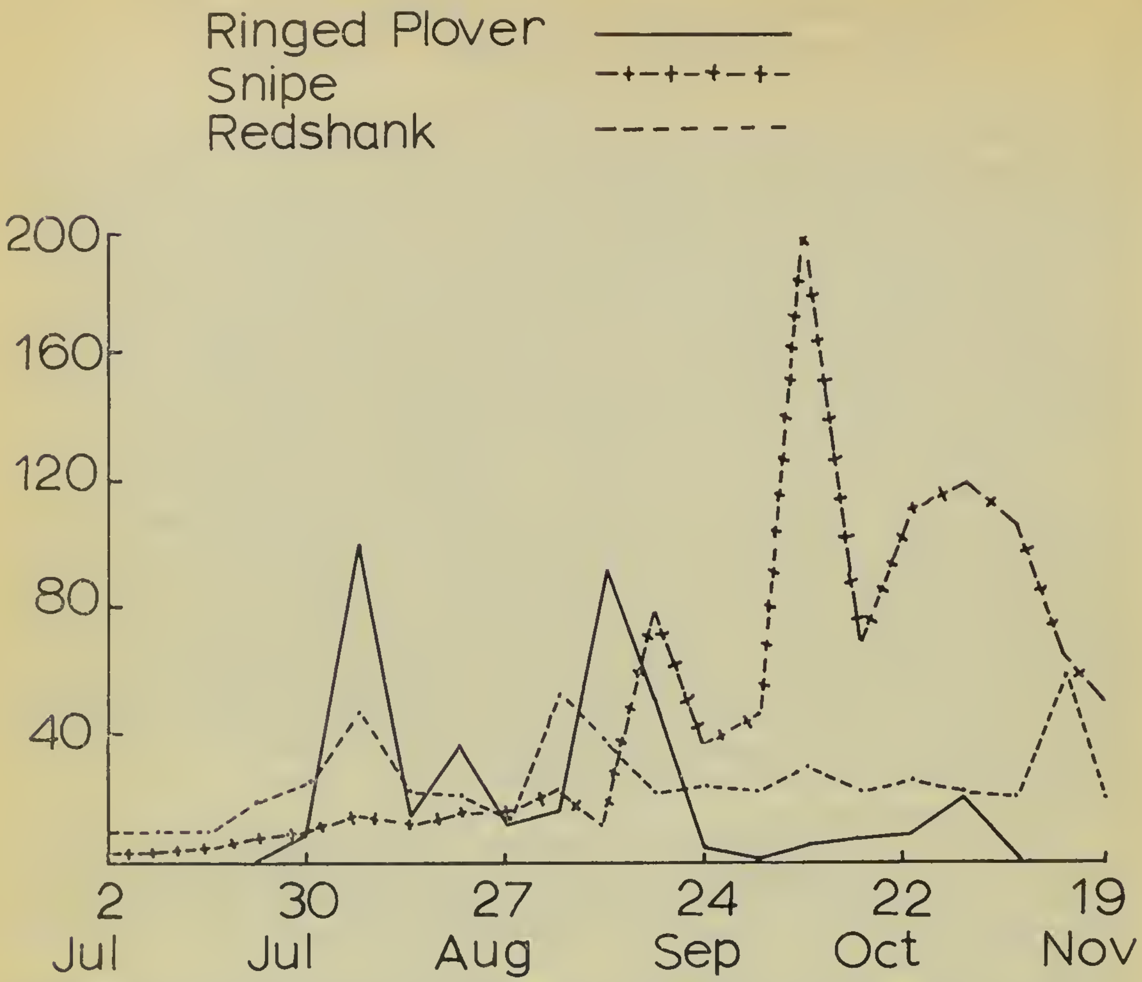

Fig. 1. The numbers of Ringed Plover (*Charadrius hiaticula*), Snipe (*Capella gallinago*) and Redshank (*Tringa totanus*) at the Inner Ribble Marshes, Autumn, 1967.

GOLDEN PLOVER (*Pluvialis apricaria*).

First arrivals of this species appear in late July as a rule although I have one record in June. Numbers remain small into August followed by a rapid build-up to early September (table 1).

From north-eastern England, Evans (1966) noted three periods of autumn immigration of Golden Plovers. He suggested that the first arrivals in July and early August consist of British birds which have moved to the coast. This is followed by an influx from mid-August to October consisting of southern birds (*apricarius*) with a final passage from early October to November involving northern birds (*altifrons*). It is impossible to define some of the fluctuations on the Ribble. Certainly the arrivals up to September often include the southern form, identifiable in summer plumage, whilst it is later that the northern form occurs. However, the separation of these two forms and their validity is very debatable (see Bannerman, 1961) and during autumn when the birds are moulting racial identification is doubtful.

It can also be very difficult with this species to say if some of the fluctuations which occur are due to migrations or just local movements. Some are definitely local, the large flocks ranging throughout the estuary.

SNIPE (*Capella gallinago*).

Although odd pairs may breed in and around the study area the Snipe occurs mainly on the Ribble estuary as a passage migrant and winter visitor. A few birds appear in late June and early July, but it is not until late August and September that large numbers pass through (figure 1). The earlier influxes are probably adults of British origin which have failed to breed and the first juveniles, followed by more juveniles and adults which have completed their post-breeding moult. Later influxes may be of Siberian, Scandinavian or Icelandic stock.

TABLE I

The weekly peaks of Golden Plover (*Pluvialis apricaria*) at the Inner Ribble Marshes in autumn 1967.

–30 July	–6 Aug.	–13 Aug.	–20 Aug.	–27 Aug.	–3 Sep.	–10 Sep.
0	1	0	0	4	800	1100
–17 Sep.	–24 Sep.	–1 Oct.	–8 Oct.	–15 Oct.	–22 Oct.	–29 Oct.
550	650	20	800	400	8	1500

Snipe are one of the most difficult species to count due to their secretive habits. Furthermore, this is accentuated by the effects of differing amounts of water in the habitat. When the area is dry very few Snipe can be found, yet the next day after light rainfall the species may be abundant. The highest counts are made when the area is flooded. For example, October 1967 was an extremely wet month and consequently the fields were flooded in places to a depth of several feet. This resulted in some very high counts. How much these were due to migrational influxes, local movements or simply to the water covering most grass and revealing the Snipe it is impossible to say.

It is also possible for extensive flooding to have the opposite effect by driving birds right out of the area.

Green and Wood Sandpipers (*Tringa ochropus*) and (*T. glareola*).

The numbers of both these species passing through the study area are always small, my highest count of Green Sandpipers being three in 1966 and that of Wood Sandpipers being four in 1963. Their appearance often coincides with easterly winds but this is not necessarily so. Green Sandpipers can appear any time from July to September, Wood Sandpipers from late July to October with one November record in 1964.

Common Sandpiper (*Tringa hypoleucos*).

The autumn migration of the Common Sandpiper through the Inner Ribble Marshes probably mainly concerns the passage of British breeding birds on their southerly movement. Some may be Scandinavian birds which appear, from two recoveries of birds ringed in Essex, to pass through Britain (Spencer, 1966).

The first migrants appear in late June and these early birds are probably either non-breeders or have failed to breed successfully. Largest numbers pass through in July and early August with peaks of up to 32 (*Lancashire Bird Report* for 1963). In 1967 the peak was only five, and this may indicate a poor breeding season. Stragglers remain up to early October.

Redshank (*Tringa totanus*).

In Lancashire, including the Inner Ribble Marshes, the Redshank breeds commonly on coastal marshes and fields. The first autumn influxes occur in the latter half of July reaching a peak between late July and September (figure 1). After this it is difficult to separate fluctuations due to tide conditions from migrational fluctuations and hence it is difficult to pinpoint major influxes with any accuracy.

Again, the early arrivals are possibly local birds whilst later ones may be of more distant northern origin. There is also the possibility that some influxes may consist of some separate age or sex groups. It is impossible to separate ages and sexes in the field with this species so that proving or disproving this is extremely difficult. It is certain that some birds from Iceland pass through the area as I have examined Redshanks of wing length greater than 170 mm. on the Ribble and these are referable to the Icelandic race *T. totanus robustus* (Harrison, 1961).

SPOTTED REDSHANK (*Tringa erythropus*).

This species, which breeds in artic Europe and Asia, is a regular migrant to the Inner Ribble Marshes in small numbers, arrivals often coinciding with an easterly airstream. Numbers are never large in the area (Table 2), up to five being recorded in most autumns. Birds arrive early in August and the last are usually seen in October.

TABLE 2

The maximum counts of Spotted Redshank (*Tringa erythropus*), Greenshank (*T. nebularia*), Little Stint (*Calidris minutus*) and Curlew Sandpiper (*C. testacea*) at the Inner Ribble Marshes since 1963.

	Spotted Redshank	Greenshank	Little Stint	Curlew Sandpiper
1963	1	7	1	9
1964	12	7	8	15
1965	4	4	7	17*
1966	5	5	6	22
1967	4	2	31	10

* This figure is from *Lancs. Bird Report* for 1965.

GREENSHANK (*Tringa nebularia*).

The Greenshank is a regular migrant in small numbers on autumn passage (table 2). Occasionally odd non-breeders summer or pass through in June. From then onwards until November passage continues, the largest numbers being recorded from August to October, generally with peaks of less than ten. Some stragglers may remain and winter in the area.

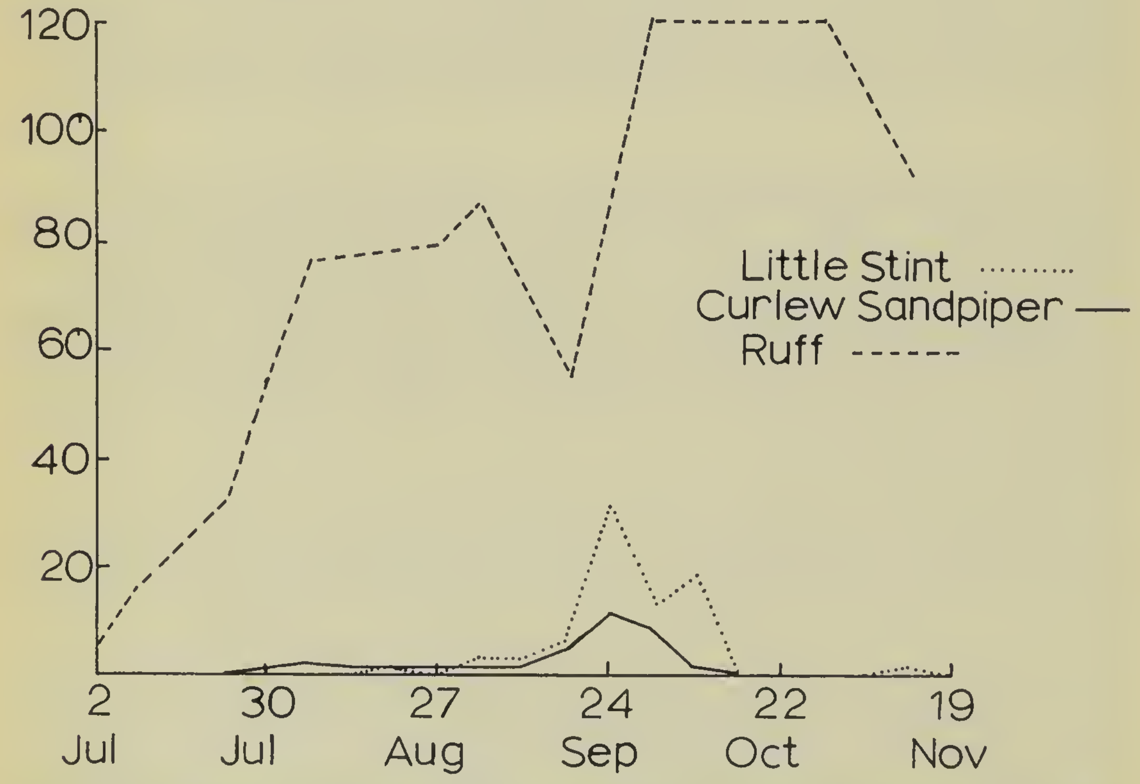

Fig. 2. The numbers of Little Stint (*Calidris minutus*), Curlew Sandpiper (*C. testacea*) and Ruff (*Philomachus pugnax*) at the Inner Ribble Marshes, Autumn, 1967.

LITTLE STINT (*Calidris minutus*).

This species is a regular passage migrant through the Ribble estuary, although numbers depend on weather conditions. With a strong easterly airstream quite large numbers may be present in the area; in most autumns up to ten occur (table 2). First arrivals appear in late July and early August, the earliest date being 9 July in 1963. Largest numbers arrive in September or October and these peaks, which consist mainly of juveniles, usually coincide with falls of Curlew Sandpipers (figure 2).

In recent years there have been two large influxes associated with easterly winds. In 1960, when Britain was visited by exceptional numbers of stints, a peak of 49 was counted in the study area. In 1967 a further large influx brought many stints to Lancashire and I noted many birds during September from Southport north to Walney Is., with a peak in the study area of 31 on 21st September.

DUNLIN (*Calidris alpina*).

A small number of Dunlin may summer on the Ribble estuary. The first migrants arrive in early July after which there is a rapid build-up to a peak in late July and early August. The size of this peak is dependent to a certain extent on tide conditions: at high tide there is a movement into the area of some birds from the estuary mudflats.

There appears in some years to be a two-peaked passage with the first peak in late July and early August, the second in September or October. In other years these two peaks may be more or less merged. In this respect the Dunlin is similar to Ringed Plover, and to some extent the numbers of these two species parallel each other.

There has been much debate as to the origins of the autumn migrant Dunlins in northern England. Brady (1949) recorded two peaks at Fenham Flats, Northumberland in late July and September which appear to coincide with those I have noted on the Ribble. Evans (1966) described a rather more complex situation in Northumberland and suggested that the first July immigrants may be local or Scottish-bred birds. He then suggested from the available evidence that the juvenile Dunlins which pass through north-east England in August come chiefly from Iceland and possibly also from Greenland and the September arrivals are probably of Scandinavian origin.

This may well be the pattern for the west coast of northern England also. However there is need for more data and a group of Lancashire ornithologists, including myself, is working on the origin and migration of many waders, including the Dunlin, through north-west England using ringing, measurements and regular counts in several areas in Lancashire. We are also trying to obtain juvenile-post-juvenile ratios in migrant flocks. There is some evidence that some of the earlier influxes consist mainly of post-juveniles, which would suggest that some of the influxes could be accounted for from an age, not geographical, basis.

CURLEW SANDPIPER (*Calidris testacea*).

This species breeds in Siberia and the autumn passage through Britain closely follows that of the Little Stint. Post-juvenile Curlew Sandpipers are regular in small numbers, arriving in the second half of July. These often have complete red plumage on arrival and may stay until they have moulted into grey winter plumage before leaving. In recent years birds have spent up to two months in the study area during which time they have moulted from summer to winter plumage.

The larger influxes of juveniles occur in September and October, the size and time of the influx being dependent on the weather conditions. With a strong easterly airstream large numbers may occur with Little Stints (see table 2 and figure 2).

RUFF (*Philomachus pugnax*).

The Ruff is an extremely abundant species in the Inner Ribble Marshes (Greenhalgh, 1967), though not breeding. First passage migrants appear in late June or early July. These early influxes up to August usually consist of adult males; the main arrivals of females and juveniles appear throughout August and September. In past years numbers have built up to peaks in September and October which subsequently decreased to only a few wintering birds. In recent years wintering birds have been more numerous. The last year of this study, 1967, saw more Ruffs than any other previous autumn (figure 2), the peak reaching 120. At least 107 wintered.

LESS REGULAR VISITORS

Two types of wader come under this category. Firstly there are those which are common and regular elsewhere on the Lancashire coast, even on the Ribble estuary a mile or so away. Birds such as the Knot (*Calidris canutus*) come under this type. On the open shore and estuary Knot are common and abundant from autumn to spring and a few straggle into the study area. Other stragglers from the open shore are Grey Plover (*Squatarola squatarola*), Turnstone (*Arenaria interpres*), Black and Bar-tailed Godwits (*Limosa lapponica* and *limosa*), and Sanderling (*Crocethia alba*). These may be recorded when driven by the tide or attracted by the feeding areas or feeding birds. Most records are from August to October.

Possibly the Whimbrel (*Numenius phaeopus*) should also be included under this heading. Although being regular, often in quite large numbers, in spring, only odd ones appear in autumn between July and September. The Jack Snipe (*Lymnocryptes minimus*) occurs irregularly in the area in small numbers, the first arriving in November or December depending on weather conditions.

Finally, the list of uncommon autumn migrants and vagrants to the Inner Ribble Marshes is long. Since 1960 there have been a Dotterel (*Eudromias morinellus*) in September 1965, Temminck's Stint (*Calidris temminckii*) in October 1963 and 1964, and Little Ringed Plover (*Charadrius dubius*) in every year since 1963, in July and August. In October 1961 there was a Grey Phalarope (*Phalaropus fulicarius*). These are of Palaearctic origin.

Of Nearctic origin since 1960 there have been a Buff-breasted Sandpiper (*Tryngites subruficollis*) in 1960, Baird's Sandpiper (*Calidris bairdii*) in 1963, White-rumped Sandpipers (*Calidris fuscicollis*) in 1963 and two in 1964, Dowitcher (*Limnodromus* sp.) in 1963, Lesser Yellowlegs (*Tringa flavipes*) in 1965 and a probable Least Sandpiper (*Calidris minutilla*) in 1967. These have occurred between August and early November and have always been associated with a strong westerly airstream across the Atlantic. Usually they have coincided with the arrival of American birds elsewhere in Britain.

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FIELD NOTE

Aquatic Warbler at Whitby — First County Record

Two schoolboys, Richard Helm and Roy Barton picked up a small bird, still alive, from the verge of Airy Hill, Whitby. They took it to Bryan Fewster, who realised that the bird was an unusual one and identified it as an Aquatic Warbler (*Acrocephalus paludicola*). This was on 6th November, 1967, an unexpected date for the species to be added to the County list. The bird died the following day and was later preserved by Mr. Fewster by injections of formalin. In this condition it was seen by the County Recorders and others and the record has been accepted by the British Birds Rarities Committee.

In the hand the bird shows clearly the dark and light striped appearance of the plumage which gives it the colloquial name of the tiger, used at Cap Gris Nez by bird watchers who know the species well. Certainly the centre of the crown and the supercillium and lores are of a clear golden buff contrasting with the black, slightly streaked sides of the head above the eye stripe. The body has a much more streaked and warmer colouring than has the Sedge Warbler (*Acrocephalus schoenobaenus*) with which it is most likely to be confused. Detailed notes of the plumage and measurements of the bird have been prepared by J. R. Mather and the specimen has been returned to the Pannett Museum, Whitby.

A. J. Wallis

A LIST OF BOTANICAL AND ZOOLOGICAL COLLECTIONS AT THE YORKSHIRE MUSEUM, YORK

C. SIMMS

This is a synopsis of major research, reference and display collections at the Yorkshire Museum, including accessions up to the end of 1966. Although the general scope of the collections is Recent British, there is some foreign (Palaearctic) material amongst the arthropods and vertebrates, and some Oceanic representation in the molluscs. Additional and replacement material, particularly Yorkshire specimens, is sought. Some of the evident gaps are being filled by selective collecting.

Collections are listed in chronological order of accession and the dates of accession are given after those of the collector or the donor. Some discrepancies between accounts of collections, and even dates of collectors, have been revealed and investigated; there are probably others and the author looks to the readership of the *Naturalist* to assist in the preparation of more accurate data as well as to point out errors and to offer additional information where relevant. The list as it stands is entirely and solely his responsibility. The author gratefully acknowledges the help of the following: J. Armitage, A. Brindle, Sir C. Richmond Brown, G. B. Corbet, Miss E. Crackles, J. H. Elliot, J. H. Fidler, J. H. Flint, Mrs. M. Fogan, W. K. Ford, E. F. Greenwood, Miss M. M. Hartley, Mrs. L. M. Irvine, Mrs. N. F. MacMillan, Miss C. M. Rob, W. A. Sledge, C. J. Smith, D. A. E. Spalding, R. T. Thompson, R. Wagstaffe, P. E. S. Whalley, A. C. Wheeler, K. Williamson, and G. F. Willmot have assisted in the compilation at various stages, whilst the York Reference Librarian (M. Smith) and his staff have been most helpful throughout. J. H. Fidler, Miss C. M. Rob, W. A. Sledge, R. Wagstaffe, and G. F. Willmot have read numerous drafts prepared by Miss M. Tindill.

Viewing of the reference and research collections must be by appointment. The nature of much of the material precludes the practicability of a comprehensive loan service but some material may occasionally be sent out where circumstances allow. There is a useful, but by no means consistently up-to-date, reference library housed with the zoological collections in the Natural History Reference Room; this includes long runs of some periodicals, and a loan service is in operation. A bibliography of the natural history department at the museum, and of published accounts of collections, obituaries of collectors and other workers, is in process of formation.

Between 1894 and 1906 H. J. Wilkinson catalogued the British Phanerograms in the herbaria of his day, adding parts of his own collection at the same time. His catalogue (4) refers to one of the major herbaria, known then as the 'Herbarium of the Yorkshire Philosophical Society'. (The museum was the property of this Society between 1822 and 1961, when it became a department of York Corporation.) Wilkinson's catalogue is still very useful, although it is not free from copying and other errors. The other major herbarium of phanerogams, that of A. Wilson, had been critically reviewed and completely card-indexed by Miss M. M. Hartley before Wilson's manuscript catalogue was discovered. There are thus two independent and valuable guides to this herbarium. The cryptogamic herbaria are not yet catalogued.

The Zoological collections have few useful catalogues at present. The large collections of Coleoptera received between 1940 and 1945 were being amalgamated by J. H. Fidler and W. D. Hincks during 1944 (2, 3) and 1945; but this work had to be left unfinished. The T. H. Allis Lepidoptera and A. C. Braham Arachnida have useful manuscript catalogues, but those for a few other collections, including the early catalogue of the Backhouse birdskins (1) can be related to collections today only with difficulty. The birds' eggs are being gradually re-organised by Miss S. Crompton and the birdskins are being catalogued and card-indexed; L. Cornwallis has been responsible for the Orders Colymbiiformes through Anseriformes and I have just completed the Falconiformes.

BRITISH CRYPTOGAMIC HERBARIA

Mrs. A. W. Legard (fl. 1875) 1890, 2,000 Marine Algae.
W. Bean sen. (1817–64) 1923, 5,000 Marine Algae and Ferns.
G. Webster (1851–1924) 1932, 4,000 Bryophytes, including some foreign material.
H. Stansfield (–1932) 1933, 2,000 Bryophytes.
H. Sowden (1870–1936) 1941, 2,000 Bryophytes of which only about 800 remain.
W. Bellerby (1852–1936), 5,000 Bryophytes.
W. G. Bramley 1942–5, 1,200 Fungi.
A. Wilson (1862–1949) 1946, 5,000 Bryophytes and Lichens.

BRITISH PHANEROGAMIC HERBARIA

The Rev. J. Dalton sen. (1764–1843) 1827, 1887, 2,000. Major contributors include the Rev. W. Bingley, W. Borrer, W. Brunton, Sir T. G. Cullum, G. Don, J. Donn, The Rev. S. Goodenough, Sir T. Gage, R. K. Greville, Sir W. J. Hooker, E. Robson, The Rev. R. Relhan, Sir J. E. Smith, W. Sole, R. Teesdale and D. Turner.
W. Middleton (–1842) 1827, 1,500. Entirely the work of Middleton.
G. Munby (1813–76) 1833. A small number of sheets remain from a once extensive herbarium.
S. Hailstone, (1767 or 1768–1851) 1859, 1887, 2,000. Major contributors include C. C. Babington, J. Backhouse (1794–1869), J. Backhouse (1825–90), S. Bromfield, W. Brunton, M. Birkbeck, G. Fitt, G. S. Gibson, J. Hailstone, 'Hustler', J. S. Howson, The Rev. J. E. Leefe, J. T. Mackay, E. Robson, 'Miss Stovin', J. D. Salmon, R. Spruce, J. Tatham, H. C. Watson, J. Ward, and J. B. Wood.
H. J. Wilkinson (1859–1934) 1892–1932, 2,000. Major contributors include H. Baines, B. Baker, J. Dalton jun., E. H. Farr, H. Fisher, the Rev. W. Gray, H. Ibbotson, R. A. Phillips, J. F. Robinson, R. Spruce, A. Templeman, F. H. Weekes and W. Whitwell.

N.B. In his *Catalogue*, H. J. Wilkinson (4) refers to other smaller herbaria, which can be interpreted as contributory to his own although he evidently regarded them as still discrete. These represent: H. Baines (with material from R. Spruce), B. Baker (S. C. Baker, W. P. Bain, J. Clapperton and J. S. Henslow), A. Bennett (H. Gluck and T. Rogers), W. Brunton, J. Dalton jun., J. W. Donaldson, J. Mennell, O. A. Moore (L. Grindon), H. M. Platnauer, J. F. Robinson, A. Templeman, 'Walker' (R. K. Greville, R. Spruce and J. Tatham), and F. H. Weekes.
A. W. Walker (–) 1892–3. Major contributors include H. Baines, R. Spruce, J. Backhouse (1794–1869) and H. Ibbotson.
E. C. Wallace 1944. Yorkshire plants, chiefly *Carex* and *Potamogeton*.
A. Wilson (1862–1949) 1946, 7,000. Major contributors include L. Arsène, C. Bailey, W. Biddiscombe, S. H. Bickham, G. C. Brown, J. Cryer, A. A. Dallman, G. C. Druce, J. B. Foggitt, J. N. Frankland, J. Groves, P. M. Hall, A. R. Horwood, A. Ley, J. E. Little, J. E. Lousley, D. Lumb, J. C. Melville, C. E. Moss, C. E. Palmer, W. H. Pearsall, J. H. Riddelsdell, F. Robinson, I. M. Cooper, W. A. Schoolbred, W. A. Sledge, R. L. Smith, J. H. A. Stewart, W. G. Travis, C. C. Vigurs, A. E. Wade, C. Waterfall, J. A. Wheldon, J. W. White and H. Wilson.

ADDITIONAL MATERIAL

Post-war additions to the herbaria have been made by a small number of workers and principally Miss C. M. Rob and R. Wagstaffe.

TRANSFERRED TO THE BRITISH MUSEUM (NAT. HIST.) 1952.

S. Hailstone (1767 or 1768–1851) 1859. British Algae and Foreign Ferns.
T. Sampson (–1897) 1894. 3,000 Chinese plants.
R. Spruce (1817–93) 3,000 Pyrennean plants.
'Walker' (–) 500 Greek Plants and
G. Webster (1851–1824) 700 packets Foreign Hepatics.

MISSING CRYPTOGAMIC HERBARIA

H. Baines (1793–1878) Mosses 1828; 'J. Dalton' 1842; The Rev. F. O. Morris (1810–93) Algae and Mosses 1885; W. H. Pearson (1849–1923) Mosses 1898; H. Y. Whytehead (fl. 1875) Ferns 1937.

MISSING PHANEROGAMIC HERBARIA

S. Stapylton (fl. 1820–30) North American 1828 and 'Herbarium Darmstedtae' 1830; W. Cattley (–1832) Russian 1831; The Rev. W. Hincks (1794–1871) 1839; The Rev. F. O. Morris (1810–93) 1843; 'J. Clarke' North American 1853; the Rev. W. L. W. Eyre (1841–1914) *Rubi* 1901; 'Miss Walker' Egyptian 1912; R. Wagstaffe 1942.

MISSING HERBARIUM

The Rev. W. Scoresby (1789–1857) Greenland 1827.

SEED AND FRUIT, DRIED COLLECTION. Sorted and listed by Miss M. M. Hartley, 1967.

Major contributors W. G. Bramley; A. A. Dallman (probably 1883–1962); Mrs. K. G. Payne and Miss C. M. Rob.

BRITISH AND FOREIGN MOLLUSCA: Cabinet collections of shells.

There are many specimens from the following collectors, in four cabinets, which were being incorporated by A. Smith before his death. These collections need critical examination by conchologists before they can be arranged, listed and catalogued.

J. Backhouse (1861 or 1862–1945); W. Bean sen. (1817–64); H. Dobson (fl. 1905–28) 1960; The Rev. W. C. Hey (1853–1909); W. Reed (1810–91 or 1892) 1889; H. Sowden (1870–1936) 1921; and possibly others including 'W. Danby', 'Gilbertson', 'The Earl of Tyrconnel', J. Hanley and J. A. Hargreaves.

BRITISH AND FOREIGN CRUSTACEA: Spirit Collection.

W. E. Collinge (1867–1947) *c.* 100, chiefly Isopoda, 1921–40. In poor condition.

BRITISH AND PALAEARCTIC INSECTA: Cabinet collections and a little recent spirit material.

The Rev. G. T. Rudd (fl. 1817–50) 1850. 2,000. Largely British Coleoptera and Hymenoptera, the remnant of a very large collection. Includes some Haworth material. Recently re-discovered and in poor condition.
T. H. Allis (Thos. Allis, jun.) (1817–70) 1870. 20,000 British Macro-and Micro-Lepidoptera with much Haworth material and several Type-specimens.
The Rev. W. C. Hey (1853–1909) 1867, 1891. 6,000 British Coleoptera. Material from 'Bates', W. Birch, J. C. Dale, J. M. Douglas, C. C. Dupré, S. Hey, W. Hey, 'Ledbetter', J. A. Power, J. C. Rye, 'Sharman' and T. Wilkinson.
W. H. St. Quintin (1851–1933) 1925–32. 15,000 Palaearctic Macro-Lepidoptera, many bred.
The Rev. W. T. Travis (1851–1924 or 1925) 1925. 6,000 Palaearctic Macro-Lepidoptera, partly merged with St. Quintin.
E. W. Aubrook 1941. 10,000 British Coleoptera, mainly Yorkshire, partly incorporated into the 'Central Reference Collection' (*vide* Hincks (2).
J. R. Dibb and W. D. Hincks (1906–61) 1941. 2,000 British Coleoptera (Carabidae), mainly North of England.
G. B. Alexander (–) 1943. 800 British Coleoptera, Yorkshire.
H. W. Ellis (1869–1943) 1945. 100,000 British Insecta, mainly Coleoptera and Hemiptera but including some 3,000 Hymenoptera (Formicidae). Mainly South of England.
T. Stainforth (1882–1944) 1944. 10,000 British Insecta, mainly Yorkshire Coleoptera.
A. Smith (1887 or 1888–1957) 1944. 150 British Diptera, local.
M. G. L. Perkins (1899–1932) 1944. 9,000 British Coleoptera, mainly East Anglian.
R. Wagstaffe, 1944–9. 200 British Orthoptera, Odonata and Diptera: North of England.
H. Britten (1870–1954) 1945. 500 British Diptera, North of England.
K. Williamson, 1945. 500 Faroë Diptera, un-named.
P. H. Grimshaw (1869–1939) 1945. 500 British Diptera, North of England.
J. H. Elliott, 1946–66. 1,000 British Hymenoptera, Hemiptera and Diptera; un-named.
H. Dobson (fl. 1905–28) 1960. 5,000 British Macro-Lepidoptera, York district.
Mrs. B. Kendall, 1966. 300 British Insecta, various Orders; Cleveland district of Yorkshire.

BRITISH AND PALAEARCTIC ARACHNIDA: Spirit collections.

F. Dixon (1871–1951) 1946. 500 British Spiders in very poor condition, local.
K. Williamson, 1946. 500 Faroë Spiders and Harvestmen, not named.
A. C. Braham, 1966. 600 British Spiders including some long series, mainly Yorkshire.

PALAEARCTIC AMPHIBIA AND REPTILIA: Spirit and skin collection.

C. Simms, 1965, 250, mainly British and Mediterranean Basin.

PALAEARCTIC AVES: Cabinet and mounted skin collections, eggs and osteological preparations.

T. Allis sen. (1788–1875) 1831–71 *c.* 100 Skeletal preparations of British and Foreign birds.
W. H. R. Read (1806 or 1808–86) 1845–? A few mounted British birds survive from a once extensive collection.
A. Strickland (probably 1784–1863) 1866. Several mounted British birds survive from a large and important Yorkshire collection.
W. Reed (1810–91 or 92) 1880. British and Foreign osteological preparations.
J. Backhouse, (1861 or 62–1945) 1902. 4,000 British and Palaearctic study skins. Much material from C. R. Bree and W. Eagle Clark.
O. Grabham (1865–1939) 1905–6. 200 British skins and eggs.
A. W. Linfoot (–1931) 1922–? 200 British mounted specimens and skins, chiefly local.
P. M. Stewart (1872–1962) 1922. 100 Mounted British Birds.
R. Wagstaffe, 1941–8. Several hundred skins including material from W. H. Barrow, Sir C. Richmond Brown, W. J. Clarke, A. Hazelwood and A. Gordon.
G. Howard (1886–1952) 1942. 3,000 British eggs, Partly the work of E. G. Potter.
E. M. Rutter (fl. 1910–48) 1942. 2,000 British eggs, local.
W. A. Cooper (1880 or 81–1943) 1944. 3,000 British eggs, mainly North Yorkshire.
N. à. Botni, 1946 *c.* 100 Faroë bird skins.

BRITISH MAMMALIA

T. Allis sen. (1788–1875) 1874. A few mounted skeletons remain from a notable collection.
O. Grabham (1865–1939) 1905. 150 British study skins.

ZOOLOGICAL COLLECTIONS WITHOUT DATA

G. C. Dennis (1848–97) 1898. 8,000 British Macro-Lepidoptera.
R. Cook (probably 1806–82) 6,000 British Macro-Lepidoptera.
B. Stewart (–) 1944. *c.* 1920. British Coleoptera.

MISSING ZOOLOGICAL COLLECTIONS

MOLLUSCA: T. W. Flower, Canadian 1846; T. Clarke, N. American; A. Crawford, Pacific 1849, 1851, 1855; The Rev. T. Barnham, Adeni 1886.

CRUSTACEA: S. Hailstone, (fl. 1835–40) 1845.

INSECTA: 'Miss Atkinson' 1823; T. Backhouse 1823–5 and 1832; P. W. Watson 1825; The Rev. J. Dalton jun., 1827; S. Stapylton, North American 1823; J. C. Latrobe, South African 1829; H. Baines, Australian 1829; T. Meynell jun., British 1830, foreign 1836 and 7; The Rev. F. O. Morris 1836, 1842, 1863, 1866, 1869 and 1884; W. C. Hewitson, foreign 1855.

AMPHIBIA and REPTILIA: T. Allis sen., 1840; O. A. Moore 1862.

AVES: L. Edmonstone, Arctic skins 1827 and 1834; 'T. Allis', Foreign skins 1834; Capt. Spencer, Indian skins 1838; The Rev. Archd. Corbett, Indian 1839; The Rev. F. O. Morris, British eggs 1842–3; J. Gould, Australian skins 1844; 'T. Meynell jun.,' 'eggs' 1844–5; B. Thompson, New Guinea skins 1889; W. Dumurgue, Indian skins 1898.

REFERENCES

(1) Backhouse, J. 1900–2. Preliminary Catalogue of the British Bird Collections in the possession of the Yorkshire Philosophical Society. *Y.P.S. Annual Reports 1899* (1900) to *1901* (1902).
(2) Hincks, W. D. 1943. A central Reference Collection of Yorkshire Insects. *Naturalist*, 1943, pp. 55–6.
(3) Hincks, W. D. 1944. Entomological Work in the North. *North Western Naturalist*, Vol. XIX, pp. 61–2.
(4) Wilkinson, H. J. 1895–1907. Catalogue of the British Plants in the Herbarium of the Yorkshire Philosophical Society. *Y.P.S. Annual Reports 1894* (1895) to *1906* (1907).

ALGAE OF THE RIVER WEAR 1. DIATOMS

A. J. PEABODY* AND B. A. WHITTON
(*Department of Botany, University of Durham*)

The algal flora of British rivers has seldom been studied intensively, and the only fast flowing one for which there is a comprehensive account is the R. Tees. Butcher, in Butcher, Longwell and Pentelow (1937), concluded that diatoms accounted for 70% of the total micro-organisms in the R. Tees, and he dealt with this phylum in some detail. Recently the diatoms of the R. Tees have been surveyed again by Whitton and Dalpra (in press). They concluded that of 148 diatoms listed, there were only five detectable changes in abundance between the two surveys, none of them involving dominant species. As the floristic composition of the R. Tees appears to have changed little in over 30 years, it was therefore decided to see how great is the difference between this river and the river immediately to its north, the R. Wear. Since Butcher's survey a considerable literature has been published on diatoms from rivers in other parts of Europe and North America, but little on attached diatoms of British rivers. The following introductory account of the epilithic and epiphytic diatoms of the R. Wear is presented for comparison with the previous literature, and as part of a general survey of this river.

The data for each species is given under the following headings:

(i) Morphological and taxonomic comments.

(ii) Records made as part of an intensive survey carried out on 3rd September, 1966 (3.IX.66). Diatom samples were taken from each of 19 sites. At each site material was collected from a range of habitats chosen subjectively to give a representative picture of the epitlithic and epiphytic diatoms present. The 19 sites are referred to in the text simply by their distance from the start of the river, and are as follows:

km 0.0	Wearhead	km 35.2	weir above Witton Bridge
km 1.0	West Blackdene	km 43.2	Newton Cap Bridge
km 2.7	Broken Way Ford	km 44.2	Jock's Bridge
km 4.4	Bridge End	km 54.2	Page Bank
km 9.2	Cambo Keels	km 65.6	downstream of Shincliffe Bridge
km 10.5	above Rookhope Burn	km 70.6	Kepier
km 13.7	Briggen Winch	km 80.6	Cocken Bridge
km 16.2	Shittlehope Burn	km 92.2	Lamb Bridge
km 24.3	Wolsingham Bridge	km 100.9	S. Hylton Ferry
km 26.3	Scotch Isle		

600 cells were counted for each site and these are referred to as the 'total diatom population' for that site. Diatoms not recorded under this heading were not found on this date.

(iii) Specific records for other dates (included only if of particular interest).

(iv) Tentative generalizations, where possible.

(v) Interesting comparisons with the literature or other comments.

CENTRALES

Melosira nummuloides (Dillw.) Ag. (i) Chains of cells 12–20 μ diameter (ii) Furthest upstream record at km 80.6; formed the majority of cells at km 100.9 (FIG. 1) (iii) Abundant on 26.VI.66 at Glasshouse Hill (km 104.2). Not recorded from R. Tees, although Butcher's lowest station was in the tidal reach.

M. varians Ag. (i) 8–20 μ diameter (ii) Furthest upstream record at km 16.2, in very low numbers; gradually increased in relative abundance to maximum at km 70.6 (iv) *M. varians* appears largely to be replaced by *M. nummuloides* in the estuarine region.

Sceletonema costatum (Grev.) Cleve (iii) A few cells on 27.VI.66 at Glasshouse Hill (km 104.2).

Thalassiosira fluviatilis Hust. (i) 18–20 μ diameter (ii) A few cells seen at km 65.6, km 70.6, km 80.6.

Cyclotella meneghiniana Kütz. (i) 9–18 μ diameter; the smallest cells found are smaller than the lower limit of 10 μ given by Hustedt (1930b). *C. kützingiana* Thwaites was not recorded from R. Wear (ii) Found in the lower part of the river, at and below km 65.6, forming 2–4% of the population.

Actinoptychus splendens (Shadb.) Ralfs (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.

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* Present address: Forensic Science Laboratory, Preston, Lancashire.

PENNALES

Tabellaria fenestrata (Lyng.) Kütz. (i) 30–140 μ × 3–9 μ (ii) five cells seen in samples from km 0.0.

T. flocculosa (Roth) Kütz. (i) 16–25 μ long; 6–10 μ wide in the centre and 3.5–4.0 μ at the poles (iv) Present throughout almost all the river, occurring as single cells, or in small numbers.

Grammatophora serpentina (Ralfs) Ehr. (i) 25–180 μ × 12–18 μ (ii) one cell noted at km 80.6 (iii) Common at Glasshouse Hill (km 104.2) on *Pilayella* on 27.VI.66.

Licmophora ehrenbergii (Kütz.) Grun. (iii) At Glasshouse Hill (km 104.2) on *Pilayella* on 27.VI.66.

Meridion circulare (Grev.) Ag. (i) 16–39 μ × 3–6 μ; somewhat narrower than the width range (4–8 μ) given by Hustedt (1930b). The var. *constricta* (Ralfs) v. Heurck also present (ii) Formed 5% diatom population at km 0.0, decreased in relative abundance on passing downstream; solitary cells only found in the tidal reaches (iv) Possibly relatively more abundant in early spring, at least in the more polluted waters (v) Described by van der Werff (1957) as an 'oligohalobe' and rheophilous. Fjerdingstad (1964, 1965) places this species in his class of saproxenous organisms, i.e. those generally occurring in biotopes other than polluted ones, but which may also be found in the presence of moderate pollution.

Diatoma vulgare Bory (i) 20–50 μ × 6–12 μ; ribs 7–8/10 μ. No attempt made to separate this variable species into its named varieties; at one extreme the forms approach *D. elongatum* (Lyng.) Ag. (ii) Throughout the river, but most abundant at km 1.0, where formed 6% diatom population (iii) A frequent organism throughout the river at all times of year (v) Fjerdingstad (1964, 1965) classed this species as saprophilous, but it does not show any such tendency in either the R. Wear or R. Tees. It is frequent in some unpolluted tributaries of R. Wear, e.g. Burnhope Burn.

D. elongatum (Lyng.) Ag. (ii) Two cells seen at km 43.2 and km 92.2.

D. hiemale (Lyng.) Heiberg (i) As var. *mesodon* (Ehr.) Grun.: 12–20 μ long and 6–12 μ wide (ii) Occurred sporadically, more common above km 35.2.

Opephora martyi Heribaud (i) If the heteropolarity is not well pronounced some confusion may arise between this species and *Fragilaria* spp. (iii) At Glasshouse Hill on *Pilayella* (km 104.2) on 27.VI.66.

Ceratoneis arcus Kütz. (i) shape very variable; includes var. *amphioxys* (Rabh.) Brun. 2.5% of the diatom population at km 1.0 (iv) Frequent throughout the year though always more abundant in the upper reaches.

Fragilaria intermedia Grun. (i) 24–34 μ × 2.5–5.0 μ; striae 11–12/10 μ. This species is not readily determined from the girdle aspect, a problem with many *Fragilaria* spp. Petersen (1938) in fact considered that *F. intermedia* is identical with *Synedra vaucheriae*, and united the two under *F. vaucheriae* (Kütz.) Petersen (iv) One of the more important diatoms of the river, though more abundant in the upper reaches.

F. construens (Ehr.) Grun. (i) As fo. *binodis* (Ehr.) Grun. (ii) A few cells seen at km 70.6 and km 80.6.

F. pinnata Ehr. (i) As var. *lancettula* (Schumann) Hust. (ii) A few cells seen at km 70.6, km 80.6 and km 100.9.

F. brevistriata Grun. (iii) Seen only once at Lumley Bridge (km 88.1) in September 1965.

Asterionella formosa Hass. (ii) One cell seen at km 0.0 (which is however below Burnhope Reservoir).

Synedra ulna (Nitzsch) Ehr. (i) A range of forms occur; perhaps the most clearly delimited is var. *oxyrhynchus* (Kütz.) v. Heurck (ii) Present at almost all stations, though more common in the upstream ones; 2% diatom population at km 0.0 and km 2.7.

S. acus Kütz. (ii) Single cells seen at km 1.0 and km 4.4.

S. rumpens Kütz. (*sensu lato*) (i) This taxon is used here as a receptacle for the smaller *Synedra* species, where the shapes of the frustule and of the central area are both variable. Cells approaching typical *S. minuscula* Grun. and *S. amphicephala* Kütz. were met. An objective separation into the various species could probably be obtained only by numerical methods (ii) Occurred throughout the river, but more abundant in the uppermost three kilometres (iv) The previous statement is probably applicable throughout the year.

S. affinis Kütz. (ii) Occurred at various sites in very low numbers; more common below km 43.2.

S. pulchella Kütz. (i) Both type and var. *lanceolata* O'Meara present.

S. vaucheriae Kütz. See *F. intermedia* above.

Eunotia bigibba Kütz. (i) As var. *pumila* Grun. (iii) Noted once, at Durham (km 67.6) on 11.x.65.

E. exigua (Bréb.) Rabh. (ii) At various sites, but most frequent from km 9.2 to km 24.3.

E. lunaris (Ehr.) Grun. (i) As var. *subarcuata* (Näg.) Grun. Typical cell: 32 µ × 4 µ; striae 16/10 µ. (ii) A few cells noted from widely separated sites.

E. pectinalis (Kütz.) Rabh. (i) Only cell: var. *minor* (Kütz.) Rabh. fo. *impressa* (Ehr.) Hust.: 52 × 5 µ, striae 15/10 µ (ii) km 16.2.

E. polydentula Brun. (i) As var. *perpusilla* Grun. (iii) A few cells seen at Lamb Bridge (km 92.2) on 23.III.66.

E. tenella (Grun.) Hust. (ii) Single cells seen at km 2.7 and at km 10.5 (above the entry of Rookhope Burn).

E. trinacria Krasske (ii) One cell at km 43.2.

Cocconeis pediculus Ehr. (i) 19–31 µ long, 10–23 µ wide (iv) An abundant epiphyte in the warmer months, in particular often smothering *Cladophora glomerata* (v) Due to the rapidity with which this organism can grow and the density of the covering it can form on *Cladophora* it seems likely that this species will prove one of the most ecologically important in the river. Although occasional cells of *Cocconeis pediculus* are found in other habitats, this is more restricted to the epiphytic habitat than any other species.

C. placentula Ehr. (i) 16–22 (–35) µ long, 8–11 (–20) µ wide (iv) Usually associated with filamentous algae other than *Cladophora*.

C. diminuta Pantocsek (i) The one valve noted was 12 × 8 µ and had striae 10/10 µ on the rapeless valve (iii) Valve found at Durham (km 67.6) on 17.IX.65.

Achnanthes minutissima Kütz. (i) 8–20 µ × 4–6 µ; some forms approach var. *cryptocephala* Grun. (ii) Throughout the river, and an important constituent of the diatom population from km 0.0 to km 35.2, reaching 73% diatom population at km 4.4.

A. affinis Grun. (ii) One cell at km 0.0.

A. lanceolata Bréb. (i) 8–20 µ × 4–6 µ. The fo. *ventricosa* Hust. also occurs, a typical cell being 35 × 12 µ, striae 13/10 µ (iv) The type occurs in small amounts throughout almost all the river; the fo. *ventricosa* is less common than the type.

A. pyrenaica Hust. (i) 11–12 µ × 4–5 µ; striae 23–26/10 µ. The alga agrees with the description by Hustedt (1939), except he recorded the striae as 21–25/10 µ (ii) Fairly common between km 4.4 and km 16.2; less common than elsewhere (v) This is apparently the first published record of this organism in the British Isles. Judging by recent European literature this may be a relatively common species which is usually included elsewhere.

A. brevipes Ag. (i) var. *intermedia* (Kütz.) Cleve. Typical cell from km 100.9: 32 × 13 µ; striae 10/10 µ. (ii) One cell at km 80.6, but quite common at km 100.9.

Rhoicosphenia curvata (Kütz.) Grun. (ii) A single cell at km 0.0, but otherwise not noted above km 43.2; most abundant at km 65.6 (iv) A frequent epiphyte, especially in the middle reaches of the river and on *Cladophora*. It is perhaps especially abundant in spring before dense populations of *Cocconeis pediculus* have developed.

Amphipleura pellucida Kütz. (ii) One cell noted at each of km 4.4, km 13.7, km 70.6.

A. rutilans (Trentepohl) Cleve (ii) Present at km 80.6 and km 100.9.

Frustulia vulgaris Thwaites (i) Typical cell: 47–55 µ × 9–10 µ. Cells from R. Wear are generally smaller than described by Hustedt (1930a; 1930b) (ii) At various stations from km 0.0 to km 100.9.

Gyrosigma acuminatum (Kütz.) Rabh. (i) 150–175 µ × 22 µ (ii) A few cells noted from km 80.6 and km 100.9.

Pleurosigma angulatum (Quekett) W. Sm. (iii) A few cells noted on *Pilayella* at Glasshouse Hill (km 104.2) on 27.VI.66.

Caloneis alpestris (Grun.) Cleve (ii) Seen only at km 0.0.

C. amphisbaena (Bory) Cleve (ii) A few cells noted at km 70.6 and km 92.2.

C. bacillum (Grun.) Mereschkowsky (i) This species is easily confused with *C. silicula* var. *truncatula*, which is equally common, and possibly also with certain *Naricula* spp. if the parallel longitudinal striae are not seen clearly (iv) Widespread, but always present in only low numbers.

C. silicula (Ehr.) Cleve (i) As var. *truncatula* Grun. The striae are faint and at least 20/10 μ (ii) At sites above and including km 26.3.

Neidium iridis (Ehr.) Cleve (ii) One cell at km 70.6.

N. dubium (Ehr.) Cleve (ii) One cell at km 70.6.

Diploneis didyma (Ehr.) Cleve (i) Typical cell: 67.5 × 22.5 μ, ribs 10/10 μ (iii) On *Pilayella*, Glasshouse Hill (km 104.2) on 27.VI.66.

D. ovalis (Hilse) Cleve (i) 25–35 μ × 12–14 μ (ii) In small amounts at four widely spaced stations.

Stauroneis smithii Grun. (ii) One cell at km 2.7.

Anomoeoneis exilis (Kütz.) Cleve (i) 20–21 μ × 5 μ (ii) As with: (iv) Occurs sporadically,

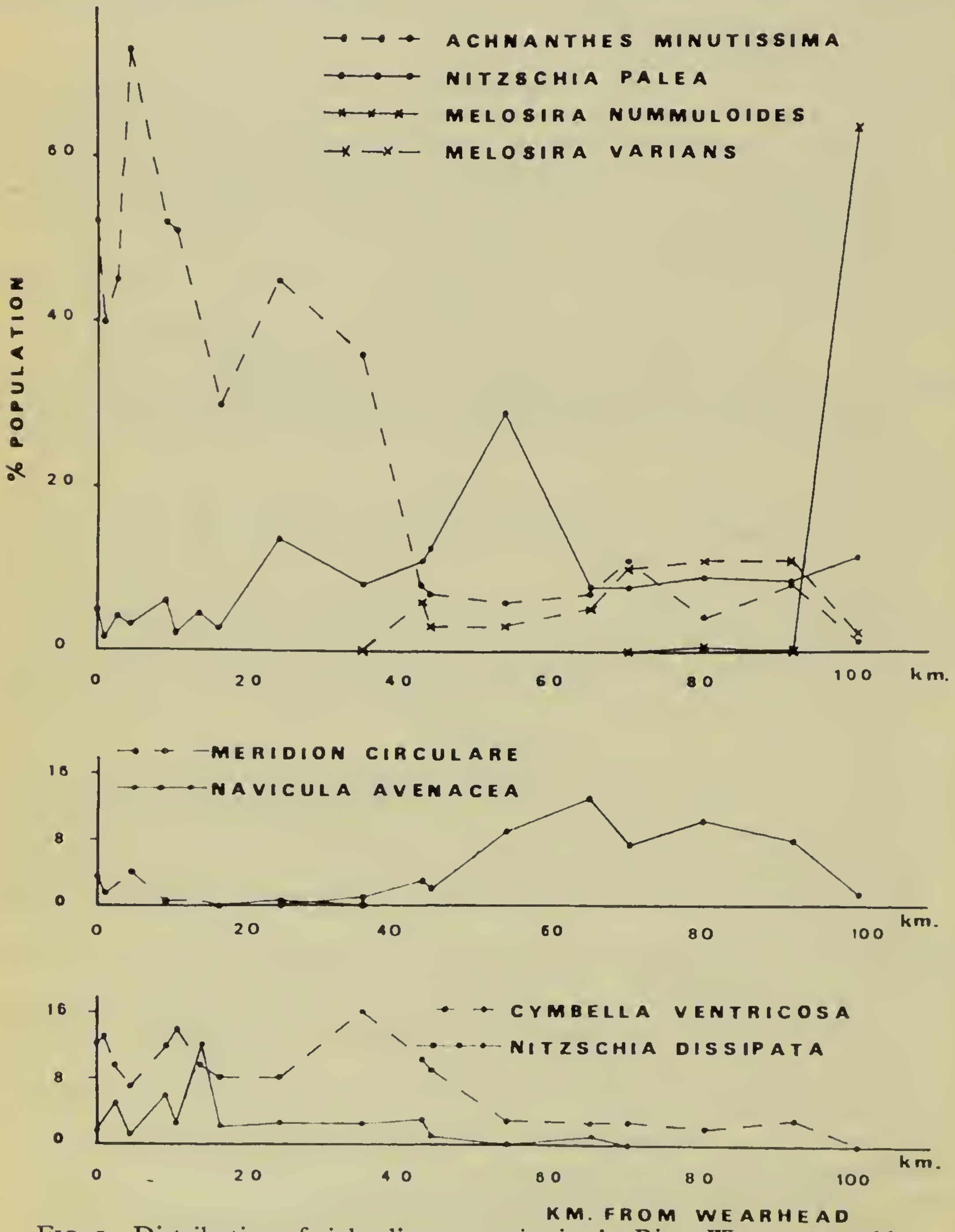

FIG. 1. Distribution of eight diatom species in the River Wear on 3.IX.66.

either singly or in small amounts.

A. zellensis (Grun.) Cleve (i) Occurs as fo. *difficilis* (Grun.) Hust.; 24 × 4 μ, striae indistinct (ii) Single cells seen at km 4.5 and km 9.2

Navicula accomoda Hust. (ii) One cell at km 24.3.

N. anglica Ralfs (i) 26 × 10 μ, striae 11/10 μ (ii) Single cells at km 2.7 and 70.6.

N. atomus (Näg.) Grun. (ii) As with: (iv) Frequent occurrence, though only in small amounts.

N. avenacea Bréb. (i) Hustedt (1930a) included this as a variety of *N. viridula* Kütz. and many subsequent authors have followed him. However by the criteria widely used for the separation of species within *Navicula* there seems no justification for doing this (ii) See Fig. 1 (iv) Generally abundant, but less common in the upper reaches and also decreasing with increasing salinity.

N. bryophila Petersen (ii) A few cells seen at km 0.0.

N. certa Hust. (i) Single cell: 23 × 5 μ, striae 12/10 μ; rather smaller than the form described by Foged (1964) (ii) One cell seen at km 0.0.

N. cincta (Ehr.) Kütz. (i) As var. *heufleuri* Grun. 18 × 4 μ, striae 16/10 μ. Smaller than those forms described by Hustedt (1930a), and Van der Werff & Huls (1955), and with closer striation than the 10/10 μ limit of Hustedt (1930a) (ii) A few cells seen at km 0.0, km 24.3 and km 70.6.

N. contenta Grun. (ii) A few cells seen at km 16.2 and km 44.2 (v) A very small cell, which in many surveys is probably overlooked or confused with certain forms of *Achnanthes minutissima*.

N. cryptocephala Kütz. (i) As var. *intermedia* Grun.: Typical cell: 35 × 6 μ, striae 16/10 μ (ii) In low numbers at km 2.7, 13.7, 16.2, 43.2 (v) See *N. gregaria* below.

N. cuspidata Kütz. (iii) Seen once at Durham (km 67.6) on 11.x.65.

N. gracilis Ehr. (i) 38–50 μ × 7–9 μ; striae 11–12/10 μ (ii) Present at and below km 13.7 but more common below km 43.2, most abundant at km 80.6 and absent at km 100.9.

N. graciloides A. Mayer (ii) A few cells seen at km 0.0.

N. gregaria Donkin (i) 15–27 μ × 6–7 μ (ii) Throughout the river, but infrequent in the upper reaches; most abundant at km 80.6 (v) It is easy to confuse this species with *N. cryptocephala* unless a mountant of high refractive index is used. A useful diagnostic feature is the distinct asymmetry of the central area in *N. gregaria*. Hustedt (1957) states that *N. gregaria* is the most common diatom species in the R. Weser, seldom missing in a single sample, and occurring in large numbers in many samples. This species has probably been included in *N. cryptocephala* in many previous surveys of river diatoms. It has been found in large amounts in many other samples, including several from the R. Tees and several Lancashire rivers.

N. hungarica Grun. (i) Occurs as var. *capitata* (Ehr.) Cleve (ii) A few cells seen between km 70.6 and km 100.9.

N. integra (W. Sm.) Ralfs (i) Typical cell: 38 × 11 μ, striae 17–19 μ. Dimensions are rather larger than the forms described by Hustedt (1930a) (ii) A few cells seen at and between km 70.6 and km 100.9.

N. lapidosa Krasske (i) Typical cell: 17 × 5.5 μ, striae at 22–24/10 μ as compared with 26/10 μ in Hustedt (1930a).

N. menisculus Schumann (i) 25–33 μ × 8.5–10 μ striae 10–11 μ (ii) Occasional throughout the river, always in small amounts.

N. minima Grun. (i) As var. *atomoides* (Grun.) Cleve (ii) As with: (iv) Frequently recorded, but always in small numbers.

N. minuscula Grun. (ii) Single cells at km 2.7, km 26.3, km 43.2, km 80.6.

N. muralis Grun. (ii) Single cells at km 4.4 and km 65.6.

N. mutica Kütz. (i) As var. *cohnii* (Hilse) Grun. (ii) Single cells seen at km 80.6, km 92.2, km 100.9.

N. pelliculosa (Bréb.) Hilse (i) 8–10 μ × 4–5.5 μ (ii) Throughout almost all the river, but most abundant at km 54.2, reaching 10% population.

N. pupula Kütz. (ii) One cell seen at km 24.3.

N. pygmaea Kütz. (ii) Occurred only at km 80.6 and below.

N. schonfeldtii Hust. (ii) A few cells seen at km 2.7 and km 16.2.

N. subatomoides Hust. (ii) A few cells seen at six of the stations between km 4.4 and km 100.9.

N. subhamulata Grun. (i) 15–19 μ × 6.5–7 μ; the striae always indistinct (ii) Seen only at and below km 26.3, most frequent at km 100.9.

N. subocculta Hust. (i) One cell only: 16 × 6 μ, striae 16/10 μ (iii) One cell seen at 1.IV.66 at Jack's Bridge (km 44.2).

N. vitabunda Hust. (ii) One cell seen at km 0.0 and a few at km 70.6.

Pinnularia braunii (Grun.) Cleve (i) Only cell: var. *amphicephala* (A. Mayer) Hust. 65 × 9 μ striae 11/10 μ (iii) In August 1966 at the Rookhope Burn inflow (km 10.5).

P. divergentissima (Grun.) Cleve (ii) One cell seen at km 0.0.

P. intermedia Lagerstedt (i) 16 × 5 μ; striae 10/10 μ (ii) One cell seen at each of km 9.2 and km 13.7.

P. interrupta W. Sm. (i) One cell: 36 × 8 μ, striae 13/10 μ (ii) One cell seen at km 0.0.

P. mesolepta (Ehr.) W. Sm. (i) 45 × 8 μ, striae 13/10 μ (iii) Seen only in August 1966 at the Rookhope Burn inflow (km 10.5).

P. microstauron (Ehr.) Cleve (i) Only cell: 48 × 11 μ, striae 11/10 μ (ii) One cell seen at km 16.2.

P. viridis (Nitzsch) Ehr. (ii) Although only a few cells at km 2.7, km 4.4 and km 35.2, nevertheless the most frequent *Pinnularia*.

P. wijkensis Foged 1964 (i) One cell: 47 × 6 μ, striae 12/10 μ (ii) One cell seen at km 2.7 (iv) Probably the first British record. Before Foged's paper, such cells were possibly referred to *P. gibba* Ehr.

Amphiprora paludosa W. Sm. (i) 24 × 10 μ, striae indistinct. Hustedt's (1930a) limits are 40–130 μ × 25–30 μ (ii) At km 100.9.

Amphora ovalis Kütz. (i) 12 × 6 μ; the small variety *pediculus* Kütz. also present (iv) Frequently present, though usually in low numbers; the var. *pediculus* may occur together with the type.

A. veneta Kütz. (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.

A. lineolatae Ehr. (iii) On 27.VI.66 at Glasshouse Hill (km 104.2) on *Pilayella*.

Cymbella affinis Kütz. (ii) One cell seen at km 0.0.

C. aspera (Ehr). Cleve (i) Typical cell: 58 × 17 μ, striae 8/10 μ, punctae 13/10 μ. The R. Wear form is smaller than the forms described by Hustedt (1930a).

C. angustata (W. Sm.) Cleve (iii) One cell seen in September 1965 at Lumley Bridge (km 87.8).

C. cesati (Rabh.) Grun. (i) 35–48 μ × 5–7 μ, striae 18–20/10 μ (ii) A few cells seen at km 2.7, km 16.2 and km 24.3.

C. cymbiformis (Ag.) v. Heurck (i) 30–33 μ × 8–10 μ, striae 8–10/10 μ (ii) A few cells seen at km 24.3 and km 43.2.

C. delicatula Kütz. (i) 22–32 × 6–7 μ, striae 17–19/10 μ. The R. Wear cells are generally larger than the limits given by Hustedt (1930a) (ii) Occurs throughout almost all the river, but most common in the uppermost stations.

C. helvetica Kütz. (i) Typical cell: 48 × 11 μ; striae 15/10 μ at the ends, 12/10 μ on the ventral side.

C. leptoceros (Ehr.) Grun. (i) 36–55 × 8.5–14 μ, striae 9/10 μ on the dorsal side, 10/10 μ on the ventral side. Cells relatively broader than those described by Hustedt (1930a) (ii) At km 1.0 and km 2.7.

C. microcephala Grun. (i) 13–15 × 3.5–4.5 μ (iv) Frequently present in small numbers.

C. naviculiformis Auerswald (iii) One cell seen on 19.VIII.65 at Wearhead (km 0.0).

C. parva (W. Sm.) Cleve (i) Typical cell: 55 × 14 μ; striae 9/10 μ on the dorsal side, 10/10 μ on the ventral side (ii) A few cells seen at each of km 1.0, km 13.7 and km 16.2.

C. prostrata (Berkeley) Cleve (i) 40–50 μ × 15–17 μ; striae 9–10/10 μ (ii) One cell seen at each of six different stations at and below km 9.2.

C. sinuata Greg. (i) 9–17 μ × 4–6 μ; smaller than the forms described by Hustedt (1930a) (ii) Occurred at almost all stations, but most abundant at km 44.2.

C. tumida (Bréb.) v. Heurck (i) 50 × 15 μ; striae 10/10 μ, punctae 16/10 μ (ii) One cell seen at km 43.2.

C. ventricosa Kütz. (i) 16–28 μ × 5–18 μ; striae 12/10 μ (ii) Throughout the river, but most common at km 35.2.

Didymosphenia geminata (Lyng.) M. Schmidt (i) 100/130 μ × 20–28 μ (ii) A few cells seen at km 0.0 and km 1.0.

Gomphonema abbreviatum (Ag.) Kütz. (ii) At most stations, but more common in the uppermost ones.

G. acuminatum Ehr. (ii) One cell seen at km 2.7.

G. angustatum (Kütz.) Rabh. (i) As var. *producta* Grun. (ii) Throughout the river, but most common from km 43.2 to km 54.2.

G. gracile Ehr. (i) 30–40 μ × 5–8 μ; striae 11–14/10 μ (ii) A few cells seen at km 16.2, km 24.3 and km 44.2.

G. longiceps Ehr. (i) As var. *subclavata* Grun. Only cell noted: 30 × 5 μ; striae 12/10 μ. (ii) At km 9.2.

G. olivaceoides Hust. (ii) A few cells seen at km 4.4, km 16.2 and km 26.3.

G. olivaceum (Lyng.) Kütz. (ii) Throughout the river, but more common below km 16.2.

G. parvulum Kütz. (ii) A few cells seen at five sties from km 0.0 to km 65.6.

G. sphaerophorum Ehr. (ii) One cell seen at km 0.0.

G. tergestinum (Grun.) Fricke (ii) One cell seen at km 26.3.

Denticula tenuis Kütz. (i) 10–16 μ × 5–6 μ (iv) Frequently present in samples, but usually in low numbers.

Rhopalodia parallela (Grun.) O. Müll. (ii) One cell seen at km 4.4.

Hantzschia amphioxys (Ehr.) Grun. (i) Only cell noted: 30 × 5 μ; striae 19/10 μ, carinal punctae 8/10 μ (ii) At km 35.2.

Nitzschia acicularis (ii) As with: (iv) At all times of year and throughout the river, though much more common in the lower reaches.

N. acuta Hantzsch (ii) A few cells seen at km 16.2, km 80.6 and km 92.2.

N. acuminata (W. Sm.) Grun. (ii) From km 80.6 to km 100.9.

N. amphibia Grun. (ii) One cell seen at km 0.0.

N. apiculata (Greg.) Grun. (ii) Three cells seen at km 80.6 (v) This species is usually found in estuarine or saltwater habitats.

N. communis Rabh. (ii) Common at km 80.6 and km 92.2, where it formed over 1% population.

N. dissipata (Kütz.) Grun. (i) 27–37 μ × 6–10 μ; carinal punctae 8–9/10 μ (ii) At almost all stations, but most common from km 2.7 to km 14.2.

N. dubia W. Sm. (ii) A few cells at sites from km 70.6 to km 100.9.

N. filiformis (W. Sm.) Hust. (i) Typical cell: 53 × 6 μ; striae 35/10 μ, carinal punctae 8/10 μ (ii) A few cells seen at km 80.6 and km 100.9 (iii) At km 67.5 on 10.IX.65.

N. frustulum Grun. (i) 23–24 μ × 3.5–4 μ; striae 22/10 μ, carinal punctae 10/10 μ. Var. *perpusilla* (Rabh.) Grun. also present: 9–10 μ × 3–3.5 μ; striae 21–22/10 μ, varinal punctae 10–12/10 μ (ii) A few cells seen at eight stations at and below km 9.2; var. *perpusilla* relatively more frequent in the lower reaches.

N. fonticola Grun. (i) 11–13 μ × 3.5–4 μ; striae indistinct, carinal punctae 14/10 μ (ii) Occasional, more common in the middle reaches, decreasing in the tidal reaches.

N. hantzschiana Rabh. (i) One cell noted: 23 × 3 μ; striae 26/10 μ, carinal punctae 7–10/10 μ (ii) At km 1.0.

N. hungarica Grun. (ii) One cell seen at km 92.2 (iii) At km 67.5 on 11.X.65.

N. ignorata Krasske (ii) At km 0.0, km 10.5 and km 92.2.

N. kützingiana Hilse (ii) At km 0.0 and km 10.5.

N. levidensis (W. Sm.) Grun. = *N. tryblionella* Hantzsch var. *levidensis* (W. Sm.) Grun. (ii) At km 100.9.

N. linearis W. Sm. (ii) Throughout almost all the river, but less frequent in the tidal reaches.

N. palea (Kütz.) W. Sm. (i) 18–35 μ × 2.5–4 μ; carinal punctae 13–14/10 μ (ii) As with: (iv) Throughout the river and usually frequent.

N. romana Grun. (ii) Two cells seen at km 54.2.

N. sigma (Kütz.) W. Sm. (ii) One cell seen at each of km 80.6 and km 100.9.

N. sigmoidea (Ehr.) W. Sm. (ii) Occasional, more common from km 80.6 to km 100.9.

N. stagnorum Rabh. (i) Only cell: 28 × 10 μ; striae 22/10 μ, carinal punctae 8/10 μ.

N. subtilis Kütz. (iii) At km 68.4 on 10.IX.65.

N. thermalis Kütz. (i) As var. *minor* Hilse: 47 × 8 μ; striae 43/10 μ, carinal punctae 11/10 μ (ii) At km 80.6 and km 100.9.

N. tropica Hust. (i) Typical cell: 17 × 2.5 μ; striae 24/10 μ, carinal punctae 10–11/10 μ (ii) at km 9.2 and km 16.2.

N. tryblionella Hantzsch (i) As var. *debilis* (Arnott) A. Mayer: 24–25 μ × 8 μ; striae 12–14/10 μ, carinal punctae 7–9/10 μ (ii) At km 80.6 and km 100.9.

N. vermicularis (Kütz.) Grun. (iii) One cell seen at Lamb Bridge (km 92.2) on 23.III.66.

Cymatopleura elliptica (Bréb.) W. Sm. (ii) At km 80.6 and km 100.9.

C. solea (Bréb.) W. Sm. (ii) at km 70.6 and km 100.9.

Surirella angustata Kütz. (i) 20–35 μ × 7–10 μ; valvar canals 8/10 μ (ii) Occasional, throughout the river.

S. biseriata Bréb. (i) As var. *bifrons* (Ehr.) Hust. *punctata* Meister (ii) Two cells seen at km 2.7.

S. linearis W. Sm. (i) As var. *helvetica* (Brun.) Meister (iii) At inflow of Rookhope Burn (km 10.5) in August 1966.

S. ovata Kütz. (i) 12–54 μ × 10–30 μ (ii) Throughout the river and often frequent.

DISCUSSION

Comparison of diatom floras from different rivers is made difficult by taxonomic problems, and by the fact that many species occur in very small proportions and thus the total list is much influenced by the total number of cells counted. However, it does seem worth making some comparisons. 168 species have now been recorded from R. Wear, 148 for R. Tees and 402 for the whole of the R. Danube (Szemes, 1967).

78 species have been recorded from R. Wear but not R. Tees. At least 54 are probably not due to any taxonomic difficulty. None of these species are so frequent in R. Wear that a real difference in relative abundance would seem to be almost a certainty, but the following are the most likely candidates: *Anomoeoneis exilis*, *Navicula atomus*, *N. integra*, *N. menisculus*, *N. subatomoides*, *Gomphonema abbreviatum*, *Denticula tenuis* (especially), *Nitzschia frustulum*.

58 species have been recorded from R. Tees but not R. Wear. At least 51 are probably not due to any taxonomic difficulty. Of these the following are the species which seem the most likely to show a real difference between the two rivers: *Eunotia arcus*, *Cymbella cistula*, *C. lanceolata*, *C. pusilla*, *Gomphonema lanceolatum*, *Nitzschia sublinearis*. *Cymbella pusilla* was recorded as common by Butcher, and was found again by Whitton and Dalpra, so this seems almost certain to differ in abundance in the two rivers.

In conclusion it may be stated that the diatom floras of the two rivers are rather similar. However, greater differences have been found between R. Wear and R. Tees than between R. Tees sampled at two time intervals separated by over thirty years. *Denticula tenuis* especially appears to be characteristic of R. Wear and *Cymbella pusilla* of R. Tees.

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THE LEPIDOPTERA OF YORKSHIRE

(*continued from* 1968, *p.* 56)

Cucullia absinthii Linn. (Wormwood Shark).

This moth was added to the county list when W. Reid found larvae near Rotherham (63) in 1953 and took specimens at light in Sheffield (63) in 1954. It has since spread rapidly and larvae have been found commonly on slag heaps and waste ground in South Yorkshire and as far north as Dishforth (65) where the food-plant was abundant alongside road-works on A1.

63. Barnsley; Bradford, 1964; Catcliffe; Doncaster, 1962 to 1966; Rotherham; Triangle, near Halifax, 1959; Wakefield; Wath-on-Dearne; Wombwell.

64. Kirkstall, 1956.

65. Dishforth, larvae, 1963.

Anarta myrtilli Linn. (Beautiful Yellow Underwing).

Well distributed and often common where there is an extensive area of Heather.

Panemeria tenebrata Scop. (Small Yellow Underwing).

Very local where it occurs but widely distributed and probably often overlooked.

62. Strensall, 1932; Thirsk, 1948.

63. Edlington, 1919; Emley Woodhouse, 1920; Secker Vale, near Barnsley, 1956; Skelmanthorpe, 1920; Worsborough, 21st May, 1949.

64. Askham Bog, 5th June, 1960; Bolton Percy, 22nd May, 1943; Farnley, 15th June, 1941; Gateforth and Selby district, on canal banks; Goldsborough, on river bank; Knaresborough.

Pyrrhia umbra Hufn. (Bordered Sallow).

Not widely distributed, taken sporadically inland but sometimes plentiful on the coast.

61. Filey, larvae common in 1959; Kilnsea, larvae common; Selby, once; Weaverthorpe.

64. Knaresborough, 21st June, 1959.

Heliothis peltigera Schiff. (Bordered Straw).

This rare migrant does not often come so far north.

61. Hull, larvae on Marigolds in 1947.

63. Little Horton, near Bradford, two, 26th August, 1955 and 6th May, 1958; Skelmanthorpe, 28th August, 1947.

64. Harrogate, one at M.V. light 16th March, 1957.

PLUSIIDAE

Eustrotia uncula Clerck (Silver Hook).

In Porritt's time this moth was known only from Askham Bog (64) but it has not been seen there for over fifty years; we have, however, two other localities.

61. Skipwith Common, regularly on the eastern fringes.

64. Morton's Bog, near Selby, 1952 and 1964.

Rivula sericealis Scop. (Straw Dot).

Scarce throughout the county although it may perhaps be overlooked; there is only one recent record.

62. Buttercrambe Woods, plentiful, 23rd August, 1942.

Phytometra viridaria Clerck (Small Purple-barred).

Very local, but cannot be as scarce as the paucity of records suggests.

62. Strensall; Douthwaite Dale near Kirby Moorside, 18th May, 1959.

Scoliopteryx libatrix Linn. (Herald).

Widely distributed but not often reported in any numbers except perhaps as larvae.

61. Skipwith, not uncommon.

62. Buttercrambe, 1933; Pickering, 13th September, 1958.

63. Sheffield; Haw Park.

64. Askham Bog, larvae common in 1945; Barlow near Selby; Bishop Wood; Harrogate, often found hibernating in a cellar, 1959 to 1965; Settle, in a cave in 1930; Leeds.

Polychrisia moneta Fabr. (Golden Plusia).

Very rare in Porritt's time but it has now become common and widely distributed, the larvae being frequent in gardens on delphiniums and monkshood.

Plusia chrysitis Linn. (Burnished Brass).

Widely distributed and often common even in industrial areas.

P. bractea Fabr. (Gold Spangle).

Widely distributed but always recorded in small numbers.

61. Hornsea Mere, 27th June, 1912; Skipwith Common, 1st August, 1959.
62. Sandburn, 3rd August, 1958; Scarborough, two in 1959.
63. Lepton, 2nd July, 1960; Sheffield, one in 1959; Triangle near Halifax, a few in 1959 and subsequently.
64. Burley Woodhead, 1st August, 1960; Harrogate, regularly 1958 to 1966; Knaresborough, several 1958–62.

P. festucae Linn. (Gold Spot).

Widely distributed and sometimes common in marshy areas. It has however also been reported from remote and bleak moorland districts. A second brood is sometimes seen in September.

Available information does not enable us to record the recently separated species *P. gracilis* Lempke.

61. Skipwith Common, frequent.
62. Strensall Common, frequent.
63. Sheffield, common.
64. Denton Moors; Harrogate, frequent; on high ground between Ingleborough and Whernside; Bishop Wood; Askham Bog; Leeds, 1960, and an unusual date, 2nd October, 1962.

P. iota Linn. (Plain Golden Y).

Well distributed and sometimes common at M.V. light.

P. pulchrina Haw. (Beautiful Golden Y).

Also well distributed. It is commoner than *P. iota* in the West Riding, as at Bradford (63) and Harrogate (64), but is much less common than the former species further east, particularly around Selby (61 and 64).

P. acuta Walk.

Only four specimens of this rare migrant have been taken in Britain. One of these was at M.V. light operated by W. Beck at Knaresborough (64) in 1955.

P. gamma Linn. (Silver Y).

Being a migrant, this moth is of very variable occurrence, in some years it is exceedingly abundant particularly in the autumn.

P. interrogationis Linn. (Scarce Silver Y).

Widely distributed in suitable high moorland areas.

62. North Yorkshire Moors from Danby to Scarborough; Wass Bank, 1933.
63. Sheffield, on moors near the Derbyshire border.
64. Blubberhouses, 1956; Harrogate, occasionally at M.V. light; Pateley Bridge, 1919.

Abrostola triplasia Linn. (Dark Spectacle).

This species is certainly much less common than the next but cannot be so sparingly distributed as the records suggest.

63. Bradford; Sheffield.
64. Harrogate; Leeds, quite common 1957 to 1962, scarce in 1963 and 1964, not seen since.

A. tripartita Hufn. (Spectacle).

Well distributed and often common.

Euclidimera mi Clerck. (Mother Shipton).

Well distributed in the eastern part of the county on railway embankments and similar habitats, but there are few records for the West Riding apart from the extreme south.

61. Selby district; Skipwith Common.
62. Pickering; Thornton-le-dale.
63. Sheffield, fairly common; Walton near Wakefield; Sprotborough.
64. Selby district; Askham Bog, one in 1960.

Ectypa glyphica Linn. (Burnet Companion).

More local than the last species, but its distribution extends further to the north-west.

61. Selby district.
62. Pickering; Pillmoor; Thornton-le-dale; Strensall Common, one in 1955.
64. Selby district; Spofforth.

Mormo maura Linn. (Old Lady).

Widely recorded, though not as frequently as formerly. It frequents river banks and prefers the sugar patch to the M.V. light. It has also been found in Sand Martins' burrows.

61. Skipwith Common, at sugar 9th July, 1959.
63. Bradford; Elland, frequent up to 1950; Oakenshaw; Sheffield, frequent; Shipley, four larvae in 1942; Triangle near Halifax, two at M.V. light in 1957; Wakefield, one 16th August, 1946 and two in 1958.
64. Barlow, August, 1958; Bolton Abbey, fairly common in 1946; Copmanthorpe, August, 1956; Harrogate, once at M.V. light in 1958 but more often at sugar in subsequent years; Knaresborough, in Sand Martins' burrows in 1965; Pateley Bridge; Selby, at sugar 1933.

Catocala fraxini Linn. (Clifden Nonpareil).

No record since Porritt's List.

C. nupta Linn. (Red Underwing).

Apart from the single specimen recorded in Porritt's List, this species was unknown in the county until L. G. F. Waddington took three at sugar at Doncaster (63) in 1941. It was then recorded quite widely in the southern and eastern parts for a period of about twelve years but has not been seen since 1953.

61. Cottingham, 27th August, 1943; Gilberdyke, 21st September, 1943; Selby area, frequent in the late 1940's; Spurn, once.
62. Buttercrambe, 6th September, 1947; near York, 24th September, 1941.
63. Doncaster, plentiful 1941 to 1946, twice in Sandal Beat Wood in 1953.
64. Selby district.

Lygephila pastinum Treits. (Blackneck).

Although it used to occur in the south, it is now only known from the eastern part of the county where it occurs on the Wolds and on the coast.

61. Thixendale.
62. Burniston, on the cliffs; Ganton.

Zanclognatha tarsipennalis Treits. (Fan-foot).

Widely distributed but not common.

63. Deffer Wood, 31st July, 1957; Sheffield, frequent; Triangle near Halifax, 1959.
64. Harrogate, four at M.V. light 17th July, 1965; Leeds; Selby, occasionally; Askham Bog.

Z. nemoralis Fabr. (Small Fan-foot).

Commoner and more widely recorded than the last species.

61. Spurn, 1949.
63. Bradford; Meltham; Sheffield; Wakefield; Wombwell.
64. Askham Bog; Bishop Wood; Harrogate; Leeds; Selby.

Herminia barbalis Clerck (Common Fan-foot).

Not recorded since Porritt's List.

Hypena proboscidalis Linn. (Snout).

Generally distributed and often common.

Schrankia taenialis Hubn. (White-line Snout).

Not recorded since Porritt's List.

S. costaestrigalis Steph. (Pinion-streaked Snout).

Very local in damp places. We have only two localities but it would probably be found elsewhere if searched for.

61. Skipwith Common, regularly.
64. Askham Bog.

MONOCTENIIDAE

Brephos parthenias Linn. (Orange Underwing).

Fairly well distributed where there is a well-established area of Birch.

61. Skipwith Common.
63. Deffer Wood; Doncaster; Sheffield; Secker Wood.
64. Birstwith; Morton's Bog near Selby.

B. notha Hubn. (Light Orange Underwing).

There is only one record since Porritt's List, for Bishop Wood (64), but it is undated and repeated searches have not confirmed it. It is very doubtful if it now occurs anywhere in the county.

Odezia atrata Linn. (Chimney-sweeper).

Locally common, especially in the West Riding and the hillier areas. Although partial to dry grassy slopes, such as railway embankments it is seldom reported from the south-east of the county where such habitats abound.

Alsophila aescularia Schiff. (March Moth).

Generally distributed and often common.

GEOMETRIDAE

Pseudoterpna pruinata Hufn. (Grass Emerald).

There are surprisingly few records for this moth in the county although its food-plants, Gorse and Broom abound.

61. Selby district; Skipwith.
63. Doncaster area; Rossington Bridge.
64. Harrogate, occasionally; Knaresborough, in Birkham Wood, 1962; Selby district.

Hipparchus papilionaria Linn. (Large Emerald).

Fairly widely distributed, it is often common on the low lying heaths, Skipwith (61) and Strensall (62). It is also taken frequently over a very wide area, in fact wherever there is a well-established growth of Birch.

Comibaena pustulata Hufn. (Blotched Emerald).

Fairly well distributed in the eastern and southern parts of the county. Apparently confined to the lower ground being reported from Knaresborough but not Harrogate.

61. Selby district; Skipwith Common.
62. Strensall Common.
63. Doncaster; Womersley.
64. Bishop Wood; Knaresborough; Askham Bog.

Iodis lactearia Linn. (Little Emerald).

Formerly not uncommon, but either it is overlooked or it has largely disappeared. There are only two recent records.

61. Langwith, at the Y.N.U. meeting on 19th June, 1965.
64. Bishop Wood, 1967.

Hemithea aestivaria Hubn. (Common Emerald).

This moth is certainly not common in Yorkshire and records are very sparse.

61. Selby district, occasionally; Skipwith Common, 1965.
62. Buttercrambe, one larva in 1946.
64. Colton near York, 1962.

Sterrha muricata Hufn. (Purple Bordered Gold).

There is only one known locality in the county, Thorne Moor (63) from which it has been recorded twice, in 1939 and again in 1955.

S. seriata Schrank. (Small Dusty Wave).

Widely distributed and often taken in gardens in urban areas.

S. sylvestraria Hubn. (Dotted Border Wave).

Very local and not often recorded except on Strensall Common.

61. Allerthorpe Common, July, 1957 and 1960; Skipwith Common, but not recently.
62. Strensall Common, regularly in recent years.
63. Thorne Moor, but not recently.

S. fuscovenosa Goeze. (Dwarf Cream Wave).

The only locality where it is known to occur in the county is at Kilnsea and Spurn (61), where it has been taken several times. The first record in July, 1948 by Dr. W. D. Hincks and H. N. Michaelis was an addition to the county list since Porritt's original record was cancelled in the supplement to his list.

S. inornata Haw. (Plain Wave).

Evidently widespread but probably often overlooked due to its similarity to one form of the next species.

61. Skipwith Common, frequent.
62. Strensall Common.
63. Deffer Wood, 1922; Huddersfield district; Sheffield.
64. Grassington, 1930; Harrogate, one in 1964.

S. aversata Linn (Riband Wave).

Well distributed and often common.

S. biselata Hufn. (Small Fan-footed Wave).

Not often recorded, but those records we have suggest a fairly wide distribution.

61. Kilnsea, 1948; Selby area.
62. Cayton Bay.
63. Womersley, 1967.
64. Hetchell Crags, near Bardsey; Harrogate, occasionally; Leeds; Bishop Wood; Askham Bog.

S. dimidiata Hufn. (Single Dotted Wave).

As with so many of the smaller and generally common species we have only a small number of very scattered records.

61. Kilnsea, common; Selby; Skipwith Common.
62. Strensall Common.
63. Skelmanthorpe, 1922.
64. Harrogate.

S. emarginata Linn. (Small Scallop).

Very local and recorded occasionally only from Strensall Common (62) in recent years.

Scopula floslactata Haw. (Cream Wave).

Local and not as widely reported as might be expected.

61. Cliffe Common.
62. Baysdale, on a Y.N.U. visit on 19th June, 1960; Buttercrambe Wood, 1959.
63. Deffer Wood, 1952.
64. Bishop Wood; Ilkley.

S. immutata Linn. (Lesser Cream Wave).

Very local and uncommon; may on occasions be confused with the previous species.

62. Buttercrambe Woods, 1940 and 1941.
63. Chevet near Wakefield, 8th July, 1946; Thorne Waste, July, 1909.

S. emutaria Hubn. (Rosy Wave).

We have only one locality for this marsh frequenting, coastal species, Kilnsea (61), where it is well established.

S. imitaria Hubn. (Small Blood-vein).

Scarce, there are only three records in recent times.

61. Kilnsea, 1948 and 1952; Skipwith Common, one, 11th July, 1937.

S. rubiginata Hufn. (Tawny Wave).

Not recorded since Porritt's List.

S. ternata Schrank. (Smoky Wave).

Although there are plenty of apparently suitable localities for this very local insect, it has only been found in a few of them.

62. North Yorkshire Moors near Scarborough.
63. Dunford Bridge, 1910; Langsett, on a Y.N.U. visit on 6th July, 1935.
64. Brimham Rocks; Grassington, 1965; Pateley Bridge, 1919.

Calothysanis amata Linn. (Blood-vein).

Scarce in the West Riding but often common in the east particularly around Selby (61 and 64) where a second brood sometimes occurs in September.

Cosymbia porata Fabr. (False Mocha).

There is only one record since Porritt's List; a single specimen taken in Buttercrambe Woods (62) in 1957.

C. punctaria Linn. (Maiden's Blush).

We have very few recent records and these are widely separated.

61. Selby district, occasionally.
62. Buttercrambe Woods, 14th June, 1932.
63. Haw Park, Wakefield, 1910.
64. Harrogate, at the Y.N.U. meeting in 1949; Selby district, occasionally.

C. linearia Hubn. (Clay Triple-lines).

Not recorded since Porritt's List.

C. annulata Schulze. (Mocha).

It used to occur in the south of the county, particularly in Edlington Wood (63), but has not been recorded there for fifty years. A single specimen was taken near Knaresborough (64) in the late 1950's and this is the only recent record.

C. albipunctata Hufn. (Birch Mocha).

This was formerly only recorded from Strensall Common, it still abounds there but we have two additional localities.

61. Allerthorpe Common, 1960; Skipwith Common, 1964 and 1966.
62. Strensall Common, abundant.

Anaitis plagiata Linn. (Treble Bar).

Fairly widely distributed where the food-plant *Hypericum* (St. John's Wort) is established, particularly in the hillier districts to the north and west.

A. efformata Guen. (Short-clasped Treble Bar).

This replaces the last species in the south and east and is often abundant on railway embankments and similar habitats.

Carsia paludata Thunb. (Manchester Treble Bar).

Not recorded since Porritt's List.

Chesias legatella Schiff. (Streak).

There are remarkably few records of this usually common moth. Presumably the areas where Broom grows extensively are not often worked late in the year.

61. Skipwith Common; Selby district.
63. Halifax.
64. Harrogate, one, 6th October, 1957; Selby district.

C. rufata Fabr. (Broom-tip).

Only once reported since Porritt's List, in the Doncaster area early in the century. (It still occurs just across the Nottinghamshire border near Bawtry.)

Nothopteryx polycommata Hubn. (Barred Tooth-striped).

This was added to the county list when C. I. Rutherford took a female at rest on an Ash trunk in Grass Wood (64) on 17th May, 1959. This habitat is very similar to the well-known locality for the species at Witherslack in Westmorland. Its presence in Grass Wood was confirmed when a second specimen was taken on 20th May, 1962.

N. carpinata Borkh. (Early Tooth-striped).

Much more local than formerly but still taken regularly in the Scarborough district.

62. Scarborough district, particularly in Forge Valley; Strensall Common, occasionally.
64. Askham Bog.

Acasis viretata Hubn. (Yellow-barred Brindle).

Very scarce and not recorded in the county for some forty years.

62. Scarborough, in the early 1900's.
64. Aysgarth, 23rd May, 1910; Grassington, 6th June, 1927.

Lobophora halterata Hufn. (Seraphim).

Two specimens taken in 1965 are the only ones recorded in the last sixty years.

62. Strensall Common, two on Aspen in 1965.
63. Wadworth Wood, June, 1906.

Mysticoptera sexalisata Hubn. (Small Seraphim).

Not recorded since Porritt's List.

Triphosa dubitata Linn. (Tissue).

Seldom common but it is recorded periodically over a very wide distribution.

61. Selby.
62. York district.
63. Bradford district.
64. Grassington; Harrogate; Knaresborough; Malham.

Calocalpe cervinalis Scop. (Scarce Tissue).

Only recorded once in the last fifty years, a single specimen at M.V. light at Harrogate (64) on 9th May, 1957.

C. undulata Linn. (Scallop Shell).

We have no records since the first World War, but there were three in the early part of the century.

62. Scarborough district; York district.
65. Bedale, in a Pine wood in 1914.

Philereme vetulata Schiff. (Brown Scallop).

Larvae have been found in a new locality recently but this is the only record since the second World War; there were several records between the wars.

61. Selby district, two larvae in 1966.
62. Buttercrambe Woods, in the 1930's.
64. Askham Bog, larvae up to 1930 but not since.

P. transversata Hufn. (Dark Scallop).

Like the last species, most of the former colonies seem to have died out but one new locality has recently been found.

63. Sheffield, one at light in July, 1954.

64. Askham Bog, up to 1930; Grass Wood, several at light on 10th August, 1963, after which record larvae were sought and found quite freely in subsequent years.

Ecliptopera silaceata Schiff. (Small Phoenix).

Widely distributed and often not uncommon.

Lygris prunata Linn. (Phoenix).

Local and seldom recorded in any numbers.

61. Filey area, regularly; Allerthorpe Common.

64. Grassington, July, 1911; Knaresborough, frequent in 1958 and 1959; York district, larvae in 1932.

L. testata Linn. (Chevron).

Widely distributed and often common in moorland areas.

L. populata Linn. (Northern Spinach).

Not reported from the low-lying parts of the county but widely distributed on higher ground wherever Bilberry abounds.

L. mellinata Fabr. (Spinach).

Generally found in built-up areas where currants and gooseberries are grown in the gardens.

L. pyraliata Schiff. (Barred Straw).

Widely distributed and although never very common it is frequently recorded.

61. Filey; Kilnsea; Skipwith; Thixendale.

63. Gargrave, 1949.

64. Askham Bog; Buckden Pike; Harrogate; Skipton, 1932; Grassington.

Cidaria fulvata Forst. (Barred Yellow).

Another moth with a very wide distribution but which is seldom very numerous; it is however usually taken in any district in which its food-plant, the wild rose, flourishes.

Electrophaes corylata Thunb. (Broken-barred Carpet).

Widely distributed and often common.

Dysstroma truncata Hufn. (Common Marbled Carpet).

Generally common throughout the county.

D. citrata Linn. (Dark Marbled Carpet).

Less common than the former species but also widely distributed. In some areas, particularly Grassington (64), it is common. It is probably often confused with *D. truncata*.

Chloroclysta siterata Hufn. (Red-green Carpet).

Very scarce in the county. Isolated records are not always to be relied upon due to the similarity of the next species, thus a record for Grassington (64) requires confirmation. Our only reliable records are for the Scarborough district (62) prior to 1940.

C. miata Linn. (Autumn Green Carpet).

Also a very local species in the county but it has been recorded over a fairly wide area with a decided bias towards the hillier regions.

63. Gargrave.

64. Garforth; Grassington, frequently; Harrogate, rare; Knaresborough; Malham.

Thera obeliscata Hubn. (Grey Pine Carpet).

Generally common wherever there is an adequate growth of the food-plant.

T. cognata Thunb. (Chestnut-coloured Carpet).

Not recorded since Porritt's List.

T. firmata Hubn. (Reddish Pine Carpet).

Much more local than *T. obeliscata* and seems to be confined to Pine woods whereas the former species frequently occurs in gardens and other districts where there is a scattered growth of Pine.

61. Everingham, 1923; Skipwith Common.

62. Strensall Common.

63. Wakefield.

64. Bishop Wood, one on 14th July, 1955; Grassington; Harrogate, rare.

T. juniperata Linn. (Juniper Carpet).

Not recorded since Porritt's List.

Lampropteryx suffumata Schiff. (Water Carpet).

A very local moth but often common where it does occur. Two of the well-known extreme forms also occur quite frequently in some localities.

62. Pickering, common in Gundale; Scarborough, common in Forge Valley in 1967.
63. Clayton West, in 1921 including ab. *porrittii*.
64. Bishop Wood, well established and including both ab. *piceata* and ab. *porrittii*, the latter on 3rd May, 1963; Buckden, 1910; Grassington, 1911 and 1965; Harrogate, occasionally, including ab. *piceata* on 5th May, 1960; Malham, 1909; Saxton, 1924; York district.

Xanthorhoe munitata Hubn. (Red Carpet).

The best known locality in the county for this mountain species is Malham (64) but there are several older records from other areas.

62. Scarborough, an old record.
63. Huddersfield, 1910.
64. Arncliffe; Malham, frequent near the Tarn.
65. Barden, 1917.

X. ferrugata Clerck. (Dark-barred Twin-spot Carpet).

Well distributed and often common particularly in the eastern part of the county.

X. spadicearia Schiff. (Red Twin-spot Carpet).

Much less common than the previous species but by no means rare.

61. Filey; Kilnsea; Selby district.
62. Hawnby.
64. Copgrove.

X. designata Rott. (Flame Carpet).

Widespread and sometimes quite common.

61. Skipwith Common.
62. Levisham; York district.
64. Appletreewick, 17th June, 1950; Bishop Wood, 6th August, 1955; Grassington; Harrogate; Malham.

X. montanata Borkh. (Silver-ground Carpet).

Widely distributed and often common.

X. fluctuata Linn. (Garden Carpet).

Very widely distributed and occurs throughout the summer so that it is commoner than its numbers at any particular time suggest.

Colostygia olivata Borkh. (Beech-green Carpet).

Local in hilly places, usually on limestone.

62. Pickering, in Gundale; Scarborough district.
64. Arncliffe; Grassington, not uncommon; Sedbergh.

C. pectinataria Knoch. (Green Carpet).

Widely distributed and sometimes common, both on moors and in woods.

C. salicata Hubn. (Striped Twin-spot Carpet).

Now very local and by no means as widespread as formerly, in its better localities, however, it still abounds.

61. Bugthorpe, 3rd August, 1933.
63. Bingley, "formerly".
64. Brimham Rocks, 8th June, 1966; Upper Grass Wood, common; Ribblehead.

C. multistrigaria Haw. (Mottled Grey).

Rather local with a preference for moorland areas.

61. Skipwith Common.
62. Scarborough district.
63. Deffer Wood; Little Horton near Bradford; Huddersfield; Penistone, 1908; Sheffield, on the moors.
64. Esholt near Guiseley; Harrogate, not uncommon; Morton's Bog near Selby; Breary Marsh, Leeds, abundantly on 30th March, 1968.

C. didymata Linn. (Twin-spot Carpet).

Widely distributed in woods and on moors but particularly plentiful on the higher moors of the West Riding.

(*to be continued*)

BOOK REVIEWS

Torrey Canyon Pollution and Marine Life, edited by **J. E. Smith.** Pp. ix + 196 with 28 plates. Cambridge University Press. 55/-.

The commendable speed with which this excellently produced book has been written and published parallels the drama and high level of public interest in the events that followed the stranding of this oil tanker. The immediate public concern was for the amenities and holiday beaches of Devon and Cornwall, but for biologists the more insidious problem was the effects on marine life of both the oil itself and the enormous quantities of detergents applied to disperse the oil.

This book describes the intensive efforts made by the staff of the Marine Biological Laboratory at Plymouth to assess the biological damage at sea and along the coastline, and to investigate in the laboratory the comparative effects of detergents used. With the many detailed maps several of the chapters read almost like improvised military operations, and indeed one of the striking things to emerge is the almost complete lack of preparations for this type of large scale emergency.

On the biological side the effects of oil itself were not catastrophic except on sea birds, and it is now clear that the natural processes of evaporation and degradation should be allowed to take place, provided areas of high amenity value are not threatened, before resorting to unrestricted use of detergents. This was not however appreciated at the time and although the detergents proved less damaging to planktonic life than had been feared, the effects on the heavily sprayed parts of the coastline and the adjacent sublittoral are such that many years may elapse before balanced populations are restored.

In a final chapter 'Some lessons learnt' the various ways of dealing with such a catastrophe are discussed. If the recommendations are heeded, and if public and official awareness of the constant danger of pollution is heightened some lasting benefit may be derived from this event. J.R.L.

A Naturalist in Russia; Letters from Peter Simon Pallas to Thomas Pennant, edited by **Carol Urness.** Pp. 189 with 47 text figures. Minnesota University Press. London: Oxford University Press. 1968. 71/6 net.

In the eighteenth century the shape of science was beginning to take on its modern form and this was a time too of active exploration and collection of biological material, of detailed description and attempted classification, and not least of intensive scientific letter writing. In all these fields Peter Simon Pallas was an outstanding exponent and the present volume is a collection of his letters to the equally versatile English, or rather Welsh, naturalist, Thomas Pennant. Primarily they are concerned with the zoology of Pallas' great journey across European and Asiatic Russia and back at the behest of the Empress Catherine; but they contain in addition all sorts of acute observations on a fascinating range of topics. Unfortunately the replies to these letters from Pennant have all disappeared but the book as it stands, excellently produced and illustrated by charming sketches from other works of Pallas, can serve as a graceful tribute to one of the really great naturalists. T.K.

Reptiles, by **Angus d'A. Bellairs.** Second edition. Pp. 200 with twelve text-figures. Hutchinson University Library. 11/6.

This is a welcome reissue of a most useful little book. New work in the ten years since it first appeared has been incorporated to some extent within the text but is mainly summarised in an additional chapter and, in such a wide-ranging review of the subject, this is quite a convenient solution. For the book deals, in well-chosen proportions, both with the variegated fossil groups which dominated the world during the mesozoic and some of which gave rise to the birds on the one hand and to the mammals on the other, and also with the general anatomy and habits of reptiles. Particularly there is a more extended account of the lizards and snakes, in which an impressive amount of information is presented in a pleasantly readable form. In a future edition the inclusion of the palatal bones in the dermal 'shell' (p. 19) could be omitted and the elastic ligament in snake jaws included, and perhaps a little more space could be found for the evolution of locomotion and the importance of the swinging quadrate in the feeding of animals which swallow their prey whole; however, as it stands the book is thoroughly to be recommended as a serious general introduction to the reptiles. T.K.

Britain's Green Mantle, Past, Present and Future by **A. G. Tansley,** 2nd edition by **M. C. F. Proctor.** Pp. 327 with 12 figures and 140 photographs. George Allen and Unwin. 50/-.

This second edition of a classic book on the vegetation of the British Isles has been brought up-to-date by M. C. F. Proctor, an ecologist from Exeter University. Those familiar with the first edition will realise that the greater part of the text remains unchanged though there are some important alterations notably in the first chapter where new knowledge given by pollen analysis has been worked into Tansley's original account of vegetational change since the last glaciation. This and the succeeding chapter, covering the historical period, put the whole account of present day vegetation in perspective and make the later chapters more meaningful. Other additions include sections on myxomatosis and important recent work such as that of Perring on chalk grassland and Lambert and her co-workers on the Norfolk Broads. Tansley's last chapter outlined possible future changes in vegetation and the proposals for nature conservation then being considered. Many of Tansley's hopes and desires for conservation have now been realised and Proctor has completely rewritten the final chapter to give the history and present status of conservation in Britain.

Another major change in the book lies in the illustrations. Many of the original illustrations could not be used for this edition and have been replaced by over a hundred of Michael Proctor's own photographs. These are very fine and it is difficult to think of a book on British vegetation which is better illustrated.

Altogether this second edition can be recommended to all who want information about the many types of vegetation found in these islands. D.D.B.

Flies of the British Isles by **Charles N. Colyer** in collaboration with **Cyril O. Hammond.** Pp. 384, 25 coloured and 28 black and white plates, text figures and diagrams. *Wayside and Woodland* Series, Frederick Warne, second edition, 1968. 55/-.

The second edition of this excellent guide to the flies appears in the new, larger format of this series. Almost twice the bulk of the previous edition, the increase in size results from the use of a larger type face and wider margins. The main alterations noted are the additions to the lists of references cited at the end of each chapter, but there are some minor emendations in the text. The larger size gives a more handsome appearance but the illustrations are not as pleasing as those in the first edition. While the same blocks appear to have been used in printing the black and white plates, new blocks have been made from the original drawings for the coloured plates and a reduction in the amount of black used results in a less clear picture, e.g. the figures of *Tanyptera atrata.* Entomologists may well cherish the plates of their first edition while welcoming the extended bibliography of the new one.

In the years since its first publication this work must have provided many with their first introduction to the flies. It remains an outstandingly successful example of what such a work should be. J.H.F.

Instant Weather Forecasting by **Alan Watts.** Pp. 64 with 24 colour photographs. Adlard Coles. 18/-.

Atmosphere, Weather and Climate by **R. G. Barry** and **R. J. Chorley.** Pp. 319 with 27 plates and 144 text figures. Methuen, University Paperback. 25/-.

B.B.C. weather forecasts are usually reliable guides as to what meteorological changes may be expected within the next day. But local conditions may vary widely and a forecast which is largely correct for a region may not be applicable to particular regions of it. The object of Alan Watts' book is to enable the user to draw his own conclusions about his own area. This is done by means of 24 colour photographs depicting skies with different cloud formations associated with deteriorating, improving or stable weather conditions. By matching the pictures as nearly as possible with the local sky and referring to the accompanying notes on major clues to be observed the inference is provided and the tables opposite each photograph give the probable trends and duration of the changes to be expected. There will be times when the weather fails to obey the rules but it is claimed that a 75% accuracy may be expected.

Barry and Chorley's book is a comprehensive and technical treatment of climatology on a world basis, incorporating recent advances in the subject. It is suitable for students of physical geography and academically minded workers in fields in which climatic factors have a significant bearing on their studies.

Excursion Flora of the British Isles by **A. R. Clapham, T. G. Tutin** and **E. F. Warburg.** Second edition. Pp. xxxv + 586. Cambridge University Press. 30/-.

As a condensed version of the larger Flora by the same authors this book is the most concise, portable and up-to-date account of British vascular plants. Since the publication of the first edition nine years ago the first volume of *Flora Europaea* has been issued. The treatment of the ferns in that work has been adopted in the new edition of the present book and the revised account of this group along with the consequential changes in the key to the Families represent the chief alterations in the new edition. There are, inevitably, some nomenclatural changes and occasional amendments and additions to the information dealing with distribution. Otherwise both the format and contents remain unaltered. W.A.S.

Invertebrate Identification Manual by **R. A. Pimentel.** Pp. 151. Reinhold. 1967. £2 2s.

This is essentially a field book for recognition of invertebrate animals by direct comparison with the illustrations, which occupy, *in toto*, half of the book and which, for the most part, are simple, clear line drawings. They are supported by a text consisting of a brief diagnosis of each taxon ranging from Phylum to Order or Family, together with an indication of habitat. It is intended for the N. American fauna but, since genera and species are not indicated, it would be useful also in Europe. For the layman, however, the text would be too technical and the book is marred for the serious student by the use of only popular names in the legends of the illustrations.

E.B.

Sky Island by **Weldon F. Heald.** Pp. ix + 166 with 65 photographic illustrations, 16 drawings and end-paper maps. D. Van Norstrand Co. Inc., London. 56/-.

The island of this book is the Chiricahua mountain range which rises from the hot and arid desert lands of southern Arizona to heights of close on 10,000 ft. 'From valley floor to mountain summit are stacked one above another all the climatic life zones one would meet on a 1,600 mile journey from northern Mexico to Canada's Hudson Bay.' It is a region of great, often spellbinding, natural beauty and it is also one of the few regions in America which is still commercially unexploited, an unspoilt sanctuary rich in natural history interest. Here Weldon Heald and his wife lived for many years and this is the story of their life in this delectable wilderness.

This is an unpretentious but evocative story of animals and plants, of the author's stream of visitors, many of them naturalists, and of the enduring fascination of their surroundings. The photographs alone tell of the superlative beauty of these mountains; but they are not used as pegs on which to hang the text. Weldon Heald was (he died shortly after the book was completed) a professional writer and this story gains much by the manner of its telling. There is a deceptive ease and simplicity about his descriptions and anecdotes which stems from his expertise as a writer and which greatly sharpen the reader's pleasure.

The Healds regarded their life in the Chiricahua mountains as an escape to and not from reality. One must have inner resources to draw upon for such a life to be truly satisfying and many people who would like to emulate them would be less well equipped to do so. But those with a taste for beautiful and unfrequented places will welcome this vicarious escape from their computerised, atomic, space-age existence. I certainly agree with the contributor of the Foreword that 'In this book there is a flavour and substance as well as good sound philosophy of a kind not to be discovered in college courses'. W.A.S.

Seashore Animals of the Pacific Coast by **M. E. Johnson** and **N. J. Snook.** Pp. vi + 659 with numerous line drawings, black and white plates and XI colour plates: Constable. 36/-.

This very well illustrated book for amateurs is a non-technical account of the very abundant animal life of the Pacific coast. It combines general biological information about the phyla and species with identification, but lacking all keys except at the phylum level its use necessitates either prior knowledge of classification or the 'match the illustrations' approach. It is an unabridged printing of a 1935 edition, complete with photographs of laboratories long since replaced, and one feels that some attempt should have been made to check the reliability of the information and to modernise the reference list. J.R.L.

Ducks, Geese and Swans by **John Welman.** Pp. 124 with 29 sketches and 16 half-tone illustrations. Isaac Pitman. 20/-.

This is the seventh in the Brompton Library series *Instructions to Young Ornithologists*, and while the first six were offered at 12/6 to 15/- the present volume is priced £1. Frankly I do not consider that, value for money, the extra cost is justified. As the jacket blurb rightly says, 'There's something very special about ducks . . . Their stream-lined symmetry and sleek often brightly-coloured plumage appeal to the eye . . . '. How necessary then, especially for youngsters, are coloured illustrations. Yet there is not one in the whole book. When I came to the sketch of Barnacle Goose (p. 33) I found it quite pathetic. Later I found others even poorer. The cross-hatching on Eider (p. 59) is bold enough for noughts and crosses; the Goldeneye (65) looks so miserable that the white cheek spot could be mistaken for a falling tear-drop.

The text is occasionally clumsy or archaic, 'A man standing in the water seems to scare birds . . . little more than a cow come down to drink does trout'. 'No one can doubt the keen sight of geese who has approached a flock grazing in the open or the hearing of ducks flushed by the cocking of a gun in a hide' (and this for youngsters!).

Several comments are either inaccurate or misleading. In the British Isles, we are told, Mergansers nest only in Scotland. The Goldeneye's courtship display is unlikely to be seen in this country. 'The easiest to spot at a distance were the *Pintail drakes* because they swam with their breasts very low in the water and their big spatulate bills pointing down.' 'In the British Isles the Common Eider breeds and is resident in northern Scotland *and Iceland* (my italics), and in England only in the Farne etc. . . . ' A typographical error on p. 111 separates the range and notes on the Spur-winged Goose from the description of the species by a heading which should follow. The range for Canvasback is missing. Our own Charles Waterton was talking of 'closet-naturalists' well before W. H. Hudson did.

The book contains chapters on the European species (a better section) and on ducks, geese and swans of the world. There are discussions on taxonomy, migrations, etc. While it is useful to have 'some account of all the 145 known species, their distribution, habits and breeding and winter range' together in one handy volume this present account will not, I fear, satisfy many of our young ornithologists. R.F.D.

Natural History by **Brendan Lehane.** Pp. 128. Michael Joseph. 12/6.

Studying Nature, Books 1–4, by **John Clegg** and **J. C. Gagg.** Evans Brothers. Book 1, pp. 64, 7/9; Bk. 2, pp. 80, 8/6; Bk. 3, pp. 80, 8/6; Bk. 4, pp. 96, 9/6.

Teaching Science out of Doors (A collection of teachers leaflets). Frederick Warne. 13/6.

Nature Trails. Pp. 22. Natural Environment Research Council. Frederick Warne. 5/–.

All these books encourage the young in taking an interest in natural history through a scientific approach. Brendan Lehane has aimed at enabling the young naturalist to equip himself for successful expeditions into the field. He suggests a number of activities and includes geology and meteorology. His vocabulary is at times too advanced for the age for which he is writing, whilst on the other hand simplification of material sometimes verges on inaccuracy. However, his ideas are good and the sensible encouragement to join the local natural history society should ensure the continued growth of interest.

The *Studying Nature* series is full of activities for children throughout the Junior School. The books are varied, relevant and gay, with many attractive coloured illustrations. Active participation by the children is encouraged through enquiry, observation and recording. The material is arranged to suit the season in order of increasing difficulty. There is a good index in each book.

Science out of Doors consists of a series of leaflets covering a wide range of topics such as 'Outdoor Plant Studies', 'Nature Trails', and 'The Marine Aquarium'. They are full of information, well illustrated and with suggestions for further reference. Aimed at the Primary and Junior Secondary School level they have many ideas suitable for school science clubs.

Nature trails are explained more fully in the N.E.R.C. booklet. Details are given on how to set one up, its successful use and maintenance, and a section is written specially to show their place in school biology teaching. M.S.G.

BRITISH MUSEUM
16 JUL 1968

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
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R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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THE YORKSHIRE NATURALISTS' UNION

ORNITHOLOGICAL SECTION

In conjunction with Bradford Naturalists' Society, the Ornithological Section has arranged for Mr. R. P. Bagnall-Oakley to present his colour film 'Norfolk Bird Life through the Seasons' on Friday, 8th November 1968 at 7.30 p.m. in Victoria Hall, Saltaire, Shipley.

Tickets price 3/6d. may be obtained from: Mrs. K. L. Butcher, 11 Fernbank Drive, Baildon, Shipley, Mr. J. K. Fenton, Moor Cottage, Burley-in-Wharfedale, or Messrs. Skelton's, 64 Market Street, Bradford 1.

B.T.O. and R.S.P.B. Christmas Cards and gift items will be on sale.

R.S.P.B. FILM SHOW, ROYAL HALL, HARROGATE
27th NOVEMBER 1968

The R.S.P.B. in conjunction with Harrogate and District Naturalists' Society will be showing new films in a programme at the Royal Hall on 27th November. The programme includes 'Sea Swallows', 'Operation Osprey', 'After the Torrey Canyon', and 'The Snowy Owls of Shetland'. Tickets 5/- (3/- for children) obtainable from the Royal Hall or from Miss M. Sanderson, 51 Lancaster Park Road, Harrogate.

There will be a sales counter and mobile display unit depicting the work of the R.S.P.B. at the film show.

Will members please make this as widely known as possible.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

FIELD BIOLOGY

The University of London awards a Certificate in Field Biology which is available to all persons interested in the study of living things in their natural habitats. The work involves a directed course of private reading at home, attendance at two Practical Courses each of two weeks held in the Summer of consecutive years, an approved plan of field-work suited to the student's locality to be written up in the form of an essay, and examinations.

The next Practical Course for new students will take place at the Orielton Field Centre, near Pembroke, from 6–20th August 1969. As accommodation is strictly limited early application is advisable.

The regulations and application form may be obtained from the Assistant Director (Room 14), Department of Extra-Mural Studies, University of London, 7 Ridgmount Street, London, W.C.1.

CYPRIPEDIUM CALCEOLUS L. in LITTONDALE

C. A. WILLOUGHBY

Littondale is a typical U-shaped glacial valley in Wharfedale, about nine miles long, with the Great Scar limestone forming the valley floor from Arncliffe to Foxup and rising in high scars at Hawkswick and Arncliffe. It is drained by the River Scirfare which joins the Wharfe at Amerdale Dub.

The first reference to *Cypripedium calceolus* L. in Littondale, is in the herbarium of John Dalton, originally in the possession of the Manchester Literary and Philosophical Society, but unfortunately destroyed in the bombing during World War II. Happily, a good account of the herbarium and plant list was written by Adamson and Crabtree (1918). In this, reference is made to "*Cypripedium calceolus.* Ladies' slipper. From the marshes about Arncliffe-in-Craven. Presented to me by Nancy Wilson of Thornton-in-Craven. V.14". Exception has been taken to this record on two grounds. Firstly it is undated, although this volume of the herbarium contained most of his Manchester records which were seemingly collected prior to 1797. It should be noted, however, that the specimen was presented to him and not collected personally. Secondly, the habitat is unlikely; *Cypripedium calceolus* is well known for being an inhabitant (in England) of tree-shaded limestone scree-slopes, it has never been found in marshy areas. There is a herbarium specimen in J. Dalton's collection at the Museum of the Yorkshire Philosophical Society labelled "From Grassington Wood, 1797". The two herbaria, however, were quite distinct. The Manchester herbarium was that of John Dalton the chemist (1766–1844) the Yorkshire herbarium belonged to the Rev. James Dalton (1764–1843).

The next reference to it is by John Windsor (1857, 1873), a Manchester surgeon (1787–1868), who, in an article on "Plants near Settle" mentions it as being found "in the narrow wood called East Field Wood and the adjoining ones near Arncliffe. About the year 1804 or 1805 a few specimens of this rare and beautiful plant were pointed out to me in this locality, by a relative of my own, Miss Petty, of Arncliffe". Windsor was too competent a botanist for this record to be suspect despite the fact that it was published more than fifty years after he had the plants pointed out to him.

Eleven years elapse before any other specimen is recorded, when in 1816 *Cypripedium calceolus* was gathered on Arncliffe Clouder by W. Shepherd, and seventeen years later in 1833 it was recorded by J. Tatham (1793–1875) the Settle botanist "below a tree of *Pyrus aria*" (Miall and Carrington, 1862).

From now on the pace of collecting seems to accelerate and about 1835 it was discovered by J. Just (1797–1852), later to become the Professor of Botany in the Manchester Institution. Two plants in bloom were found and five small seedlings. Two flowers were taken and on becoming known the plant was "sought out by gardeners from the neighbourhood of Manchester and rooted up" (Cash, 1873). J. Just commendably deplored this but managed to gather another specimen in 1842 now in the herbarium of the Butler Museum, Harrow School.

A significant event in the history of *Cypripedium calceolus* around Arncliffe took place in 1835 when the Rev. William Boyd was appointed to the living of Arncliffe and Halton Gill. In 1847 he "sent Mr. Tatham a specimen of a really wild *Cypripedium calceolus* found this summer by one of his pupils" (herb. BIRA). In the herbarium of the British Museum there is another specimen ex herb. J. Tatham from Arncliffe Clouders, collected at the same time. 1850 saw two specimens obtained by Boyd on 31st May, one is in herb. J. W. White (BRIST), the history of the other (herb. GL) is not known. In Lees' *Flora of West Yorkshire* (1888) appears the entry "East Field Wood, 1860; James Ward, spn. in herb. Lees; Id., spn., 1867; herb. G. E. Smith". Neither of these specimens can now be traced but one would assume that the 1860 specimen at one time formed part of Lees' own herbarium. It is not at the Cartwright Hall, Bradford, nor in that part of his collection which is at the British Museum. G. E. Smith's herbarium is now at the Royal Botanic Gardens, Kew, but again, there is no specimen collected in 1867 by James Ward.

In 1869 a specimen was gathered by Miss Julia Boyd (herb. HAMU) and from then until 1878 reference to the species is confusing. In the latter year a specimen was taken in "the first week of June, per Miss Wheatley" (herb. Whitwell, BIRA). In a written comment accompanying the specimen Whitwell states "Undoubtedly taken from the Rev. Canon Boyd's garden at Arncliffe, though given to me as wild. I have corresponded with the Canon Jan. 1887". There is no record of any reply by the Canon.

The orchid was reported as having disappeared from the woods on the south side of Littondale by 1891 (Hobkirk & Lee) but the Rev. W. A. Shuffrey verifies its presence in "Lower Arndale" in 1901. In 1904 he again reports it in the Arncliffe vicinity but noted also that attempts had been made to dig it up. In 1905 it was collected by S. H. Bickham on 4th June (herb. CGE) and the last wild specimen seems to have been taken out of Littondale on 12th July 1914 by G. Walworth (herb. UCNW).

It would not be right to mention *Cypripedium calceolus* and Littondale without referring to its culture in gardens in that area. The first reference to its being in cultivation is by Whitwell writing of the specimen "undoubtedly taken from the Rev. Canon Boyd's garden" in 1878 (herb. BIRA). Canon Boyd took up the living in 1835 and there is reference (Ward, 1858) to his intensive horticultural activities in 1858. It is possible that the orchid was in his garden by then, or even before. In 1891 there is further reference (Hobkirk & Lee, 1891) to *Cypripedium calceolus*, "still growing in a garden in the dale". This may well support J. F. Pickard (herb. LDS) who suggests that it was still in the vicarage garden in 1902 but had died out by 1906. He gives the date of introduction into that garden as "1875 or 80".

It is, however, the plant which was taken into the Falcon Inn which gives a good picture of the orchid under cultivation. It is thought that the plant was first put there sometime between 1918–20. The origin of this plant is obscure. It has been said that Canon Shuffrey planted the orchid at The Falcon Inn and that the original plant came from Kettlewell. Canon Shuffrey, however, departed from Arncliffe in 1916. According to J. F. Pickard it was "transplanted as a large healthy plant" (note in herb. BIRM 1932) and this suggests that it was done by someone in the immediate vicinity. Another version is that the plant was gathered at Arncliffe by W. H. Stansfield, taken to Southport where it failed to flourish and then eventually brought back to Arncliffe in a moribund condition and planted at The Falcon Inn (Frankland, 1966). Strangely enough in *The Naturalist* (1922) appears the following, taken from a local newspaper: "Mr. W. H. Stansfield . . . understands that Mrs. Miller, hostess at The Falcon hotel still has a fine specimen of this rare and beautiful plant." If he himself had placed it there, one would have expected him to be more explicit about its presence.

In 1925 it had about 13 blooms according to J. F. Pickard and again in this year C. B. Tahourdin in his *Native Orchids of Britain* is "indebted to Mr. M. Miller and Mr. H. W. Burge for the specimen of *Cypripedium calceolus*".

It is again mentioned in July 1926 when leaves only were obtained (herb. Reynolds, BOR). On 16th July 1928 three specimens were collected (herb. Frankland & herb. Holder LIV). The orchid was probably flowering again in 1929. John Crowther in *Silva Gars* mentions *Cypripedium* "flowering in a garden at Arncliffe"; ten strong healthy plants (? stems) were in bloom and he learned from the owners that they had grown it from a specimen collected in a wood at Kettlewell.

A specimen in herb. Brit. Mus., ex herb. Thos. J. Foggitt from "Arncliffe, Littondale, 11th June 1930" is labelled as being from a garden and was very likely from The Falcon Inn. In 1932 a specimen was obtained in early June by J. F. Pickard — "one of seven blooms ten heads" (? stems) (note in herb. BIRM, 1932). He also indicates its origin prior to being brought into cultivation as Arncliffe. The last reference to *Cypripedium* in the garden of The Falcon Inn is on 2nd–9th June 1934, when the Alpine Garden Society (Anon. 1934) visited this hotel and saw the orchid with seven flowering spikes.

The ultimate fate of the plant is not known except that one year there were eighteen flowers, four of them in pairs on two stems. After this effort the plant seemed to degenerate and finally disappeared. Whether it died naturally or was taken by a collector is not known. The production of eighteen blooms was mentioned in a note by Pickard on the specimen taken in 1932 (BIRM). In the same note he also suggests that the production of a large number of flowers may be followed by a season in which only leaves are produced. That happened with this particular plant.

The main reasons for the gradual disappearance of *Cypripedium calceolus* from Littondale can be put down, very probably, to the natural hazards to which the orchid is prone, sheep grazing, cattle trampling, slug and rabbit damage but, by and large, the greatest cause of the decline in numbers is the collector — whether by intent as in the case of the botanist, or accidental collection due to lack of knowledge on the part of lay people. To mention a few examples — the habitat in which it was found by Just in 1835 was "sought out by gardeners from Manchester and the plant rooted up" (Cash, 1873). There is also the story told by Boyd of the enthusiastic Professor of Botany who offered a guinea for a "root". In the absence of the vicar one year in the early summer it was "uprooted ruthlessly" (Boyd & Shuffrey, 1893). The Canon himself however, seems to be not without blame in this respect. He ensured that the orchid did not seed, because every year, on the first appearance of the bloom, it was carefully cut off. It is interesting to speculate on the fate of these flowers when removed. If mature — one might think more should be preserved in herbaria. One can only assume that they were cut off very young or not many blooms were found to be cut off. A correspondent in the *Yorkshire Post* (Anon. 1906) said of Archdeacon Boyd "fearful of its (*Cypripedium calceolus*) total extermination he transferred all specimens he could hear of to the vicarage garden". He did contemplate trying to transplant specimens from his garden to the environs of Arncliffe but "the dread of ruthless botanists with empty baskets" acted as a very salutory deterrent (Boyd & Shuffey, 1893).

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SOME INTERESTING RECORDS OF FLAT-FLIES (*DIPTERA: HIPPOBOSCIDAE*) FROM HIRUNDINIDAE & APODIDAE

GORDON B. THOMPSON AND HARRY E. BEAUMONT

Thompson (1947 & 1953) drew attention to the fact that many of the old records of *Stenepteryx hirundinis* (L.) from Hirundinidae other than the specific host, *Delichon urbica* (L.) (House Martin), may well have been incorrect because the hosts were incorrectly identified. A few records of *S. hirundinis* and *Ornithomya* spp. from Hirundinidae are, however, quite authentic (see Thompson, 1953, 422–3). The Hirundinidae are represented in the United Kingdom by *Hirundo rustica* (L.) (Swallow), *D. urbica* (L.) and *Riparia riparia* (L.) (Sand Martin) and the Apodidae by *Apus apus* (L.) (Swift). Oldroyd (1966) said "Rather surprisingly and contrary to many records neither [*C. pallida* nor *S. hirundinis*] is a common parasite of the Swallow though a few authentic records exist (including one that came to my notice recently) of *Stenepteryx* on that host". This statement revived the interest of one of us (G.B.T.) in the occurrence of these host-specific parasites on other hosts and following some correspondence with Mr. H. Oldroyd, to whom we are very grateful, details were provided of these records. One of them had been provided by H.E.B. and as a result of correspondence we thought it worthwhile publishing our records.

The following records, with three exceptions, are unpublished and based mainly on material in our collections. In the case of specimens collected by others, every attempt has been made to verify the circumstances of the captures and the identification of the hosts can be taken as correct.

Ornithomya avicularia L.

1. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Adwick-le-Street, 4.viii.1963 (*H.E.B.*). The host was caught along with other bird species, placed in a separate bag immediately and the fly collected later.
2. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Low Ellors Carr, 18.vii.1965 (*R. Moat*). This specimen was taken from a Swallow caught at a roost, the few other bird species were bagged separately.
3. 1♂, *H. rustica* (Swallow – juv.), Yorks., Knaresborough, 30.vii.1967 (*J. R. Mather*). An authentic record.
4. 1♀, *D. urbica* (House Martin – juv.), Yorks., Barnsley, Wombwell, Lundhill, 15.vii.1967 (*J. W. Hartley*). The host was mist-netted at a small sewage works and the fly was collected from the bird at the time of handling.

O. chloropus Bergroth.

5. 1♂, *H. rustica* (Swallow), Yorks., Spurn, 19.v.1966 (*B. R. Spence*). The host, along with other Swallows, was considered by Mr. B. R. Spence to have overshot its breeding area on spring migration and to be returning south when trapped, a theory which was strengthened by the recovery of some of the Swallows further south in June and July of the same year. Whether the fly was acquired on the Continent, carried north then south to Spurn or whether it was acquired north and carried south is a matter of conjecture, in any case the date is very early. This particular bird was collected on its own.
6. 1♂, *R. riparia* (Sand Martin – ad.), Yorks., Skipton, Appletreewick, 26.vi.1966 (*H.E.B.*). This fly was the only specimen collected at a Sand Martin colony but two others were seen to leave adult birds on the same date and on 3.vii.1966 single flies were seen to leave 2 juvenile and one 'un-aged' Sand Martins.

O. fringillina Curtis.

7. 1♀, *H. rustica* (Swallow – juv.), Yorks., Mexborough, Old Denaby, 5.ix.1966 (*H.E.B.*).
8. 1♀, *H. rustica* (Swallow – juv.), Yorks., Doncaster, Sprotborough, 3.viii.1967 (*H.E.B.*).
9. 1♀, *H. rustica* (Swallow – juv.), Yorks., Mexborough, Old Denaby, 10.viii.1967 (*H.E.B.*).
   No. 7 was collected from a bird at a roost where no other bird species were present. Nos. 8 & 9 were taken from catches consisting only of Swallows but Sand Martins and Warblers were also present at Sprotborough and Sand Martins were also present at Old Denaby.
10. 1♂, *R. riparia* (Sand Martin), Leics., Rothley, 7.viii.1960 (*C. T. Beverley*). This is the specimen referred to by Oldroyd (1966). The data are 'with three others on various dates from Sand Martins'. Mr. C. T. Beverley (*in. litt.*) tells us he has taken several flies at a breeding colony in a dry sand pit at Rothley from Sand Martins and the specimen referred to above was taken from an adult ♂ bird caught in a mist-net sometime between 7.00 – 9.00 p.m.

S. hirundinis L.

11. 1♂, *R. riparia* (Sand Martin), Yorks., Knaresborough, 19.vi.1966 (*D. M. Burn*). This record has been published in Rep. Knaresborough Bird Ringing Station (1966), 1967, 7, by the collector (D.M.B.).
12. 1♀, *R. riparia* (Sand Martin – ad.), Suffolk, nr. Bury St. Edmunds, Timworth Hall, 15.vii.1967 (*G.B.T.*).
13. 1♀, *R. riparia* (Sand Martin – ad.), Suffolk, nr. Bury St. Edmunds, Timworth Hall, 15.vii.1967 (*G.B.T.*).
    These two flies were the only ones taken from birds caught in mist-nets at a

Sand Martin colony. A total of 253 adults and 132 juveniles was examined. At least two other flies were seen.

14. 1♂, *R. riparia* (Sand Martin – ad.), Herts., Rye Meads, 30.v.1965.
15. 1♂, *R. riparia* (Sand Martin – juv.), Herts., Rye Meads, 21.viii.1965.
16. 1♂, *R. riparia* (Sand Martin – juv.), Herts., Rye Meads, 3.viii.1966.
17. 1♂, *R. riparia* (Sand Martin – juv.), Herts., Rye Meads, 5.viii.1966.
18. 1♂, *R. riparia* (Sand Martin – juv.), Herts., Rye Meads, 24.viii.1966.

Records 14 & 15 have recently been published (Lloyd-Evans, 1967) and nos. 16, 17 & 18 have been kindly supplied by Dr. L. Lloyd-Evans, Secretary, Rye Meads Ringing Group, who tells us (*in litt.* 16.i.1968), "On one occasion only, 30.v.1965, House Martins were also caught and handled, but on that day the infested Sand Martin was caught and de-loused an hour before the first House Martin and in all cases precautions were taken against straggling.

C. pallida Latr.

19. — *H. rustica* (Swallow), Yorks., nr. Rotherham, Micklebring, 3.vii.1963 (*R. Bramhill*). This specimen was also referred to by Oldroyd (1966) and we are certain of its authenticity.

Since the publication of Thompson's summary of the records of Hippoboscidae from Hirundinidae (1953) and the Bibliography (1955) some additional records have been noted. Thompson (1952) recorded 2♂♂, *O. fringillina*, Swallow – nestling, Lincs., Gibraltar Point, 7.vii.1950. Bequaert (1953) referred to a specimen of *S. hirundinis* from Sand Martin, Suffolk (*R. Meinertzhagen*) but we have no further details. The identifications of both fly and bird can be accepted. Hill (1962a) listed one record of *O. avicularia* from House Martin, two records of *O. chloropus* (= *O. lagopodis* Sharp) from Swallow but gave no details. These records may be based on some of those referred to by Thompson (1953).

Beaumont (1965, p.100) listed a record of *S. hirundinis* from 'Swallow, 1935, Kexborough'. This is Bayford's (1908) record of an addition to the list of Yorkshire Diptera. The late C. A. Cheetham (*in litt.*, 10.v.1950) gave details of this record — '*Stenopteryx* (sic) *hirundinis* L. — Kexbro' (Doncaster), on young Swallows in school grounds (*G. H. Sutton*)', which is as he recorded it in 1936. Unfortunately Beaumont incorrectly assumed the date of collection was in 1935 because it was listed by Cheetham (1936) in the Annual Report for 1935. The specimen cannot be found in Bayford's collection which was donated to Barnsley Corporation and it seems safe to accept the identification of the fly but not that of the bird.

In view of the host specificity of *S. hirundinis* it is safe to assume its occurrence on other species of birds is accidental. The House Martin and the Swallow build their nests under eaves, etc. and in cowsheds, outbuildings, etc., respectively. There is little competition for nesting sites and apart from feeding together there is very little relationship between them, although there are records of them nesting in close proximity. It is not surprising therefore that we know of no records of *S. hirundinis* from Swallow. Ecologically it seems unlikely that a transfer of parasites could occur at any stage in their life histories. On the other hand we list the Sand Martin as host of *S. hirundinis* on nine occasions. These can probably be explained by the fact that House Martins occasionally enter Sand Martins holes and sometimes remain in them overnight. However, Chris Mead, who has ringed thousands of Sand Martins at their nesting sites, tells me he has only noted one House Martin in three to five thousand Sand Martins coming out of holes. Additionally, there are isolated reports of attempted coition between House Martins and Sand Martins.

In the case of the *Ornithomya* spp., host specificity is not marked but they each have a number of preferred hosts or breeding hosts upon which they seem to feed and reproduce. The relatively few records of their occurrence on Hirundinidae indicates these are also accidental. The nests of House Martins and Swallows are frequently appropriated by House Sparrows which are an integral part of the community in which they live. Tree Sparrows have been known to nest in Sand Martins holes and occasionally House Sparrows when the holes are in close proximity to buildings, etc. Some Starlings also nest within similar areas, in sites shared by Swallows, House Martins and House Sparrows, and in autumn, particularly at sewage works, Starlings are often seen sitting on overhead wires in company with

Hirundinidae. *Ornithomya* spp. are commonly found on Starlings, House Sparrows and Tree Sparrows and there is therefore ample opportunity for their transfer to Hirundinidae especially since they are able to fly.

The occurrence of *C. pallida*, the specific parasite of the Swift, on a Swallow may be explained by the occasional proximity of their nests because these flies frequently stray from their true hosts' nests. Keymer, Rose, Beesley & Davies (1962) recorded two specimens of *S. hirundinis* from a Swift captured in a weak condition, near Weybridge, Surrey. This may well be another instance of the fly straying from a nearby nest. There are probably simple explanations of all these unusual occurrences but until they present themselves the possibilities mentioned above may explain them in part.

NOTE.— Hill (1962b) stated "*O. biloba* Dufour, 1827, which is common on the Continent on hirundines, is an occasional visitor to Britain. This fly is a common parasite of Swallows and occasionally occurs on House Martins and Sand Martins on the Continent according to Theodor and Oldroyd (1964). Dr. L. Lloyd-Evans (1967) has recently published the first record of this fly from Britain — a single specimen (sex not stated), from Swallow, ad. ♀, Herts., Rye Meads, 6.vi.1964. The host was one in 'a considerable movement of hirundines at Rye Meads on that day and the host Swallow had probably just arrived from the Continent'.

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Social and Natural Biology: Selections from Contemporary Classics edited by **Cecil E. Johnson.** Pp. viii + 272. Van Nostrand. 28/-.

This book brings together excerpts from the writings of authors of distinction. It contains nineteen extracts from fourteen authors, amongst them being Aldous Huxley, John Steinbeck, Rachel Carson, Konrad Lorenz, Thoreau and Tinbergen. The selections are arranged under three themes. Those on Evolution, Eugenics and Population Perspectives place the emphasis on human population dynamics. The second section includes essays on natural history and the final section has four essays on Animal Behaviour. It is unlikely that all will be read with equal interest and enjoyment but it is equally unlikely that several will not give great pleasure and perhaps lead the reader to further enjoyment of the authors of his choice. W.A.S.

MARINE FISHES AT SCARBOROUGH DURING 1967

D. E. WHITTAKER

For the past twenty years, the marine fishes inhabiting the waters off the Yorkshire coast have been greatly neglected, and there have been no serious workers on this aspect of the Natural History of our area since the days of W. J. Clarke. One new addition was made to the Yorkshire list in 1967, and some very rare visitors to these waters were obtained.

The first of these rare visitors was obtained on 24th August, following a message from the Beach Inspector that a 'queer fish' had been found in the North Bay. On arriving at the North Bay, we found the beach thronging with visitors and a large crowd gathered around the 'queer fish' that had been dragged the length of the beach to a grass slope on the foreshore. The fish was a specimen of one of the remarkable Trachypteridae or Ribbon fishes, which are usually and then only rarely, encountered in or adjacent to areas of deep water, the normal swimming depth being in the twilight zone at about 200–300 fathoms of water. Our specimen was the Dealfish, *Trachypterus arcticus* Brunn, normally found in the cold waters to the north of the British Isles and certainly extremely rare so far south in the North Sea. We have in fact only one previous record, for a specimen captured in 10 feet of water in Filey Bay, in June 1964. Because of the rarity of this species it has now been skinned and will in due course be mounted for the fish collection at Scarborough. The fish was discovered in three feet of water, and in order to land it upon the beach, local Life-guards placed a thick rope around the root of the tail which was soon severed from the body and lost upon the crowded beach, while the rest of the fish was dragged up onto the grass slope. In length the specimen is 6 feet 4 inches, and when complete it would probably have been about 7 feet 2 inches long to the tip of the caudal fin. Further damage occurred to the specimen when a Life-guard, not realising the importance of the capture, almost cut the body into three parts after deciding that the middle section would be good to eat. Fortunately he was stopped before his knife had done irreparable damage. The Dealfish is a wonderful sight when fresh from the sea, being of a glossy aluminium colour, with darker shades upon the head and smokey patches on the anterior portion of the body, which is studded with very low, rounded tubercles. The dorsal and pectoral fins are bright crimson but in the adult stage these fishes lack any pelvic fins, the Scarborough specimen possessing two small furrows about ¾″ long, one on either side of the body on the ventral margin, showing the sites of origin of the pelvic fins when in its juvenile stage. The Scarborough specimen was a mature female, with an ovary 28.5 inches long and containing ova almost 0.2 inches in diameter.

The Dealfish belongs to the Order Allotrignathi, a small group of fishes characterised by the unique buccal mechanism that enables the members of this Order to obtain food. The mouth is constructed in the form of a collapsible extension that can be rapidly shot out towards the prey, which generally consists of small pelagic fishes and crustaceans, and the result of this action is to cause a suction of the victim, together with a little water, into the mouth and hence the victim is secured in an instant. The head of the Scarborough Dealfish is in perfect condition and this has enabled me to prepare the accompanying sketches. Because of this device and the fact that the prey is quickly swallowed, there is no real use for teeth, and hence the members of the Allotrignathi have very feeble dentition, the Scarborough specimen being a good example of this. The teeth are distributed 1:5 on the upper mandible and 6:6 on the lower, and all are sharp, backwardly pointing and of irregular size. The large eye of this specimen was margined in crimson with outer margins of gold and finally black. The ovate pupil was large and positioned obliquely across the iris, the latter being whitish with golden and smokey coloured iridescences. The following are additional particulars:

BODY

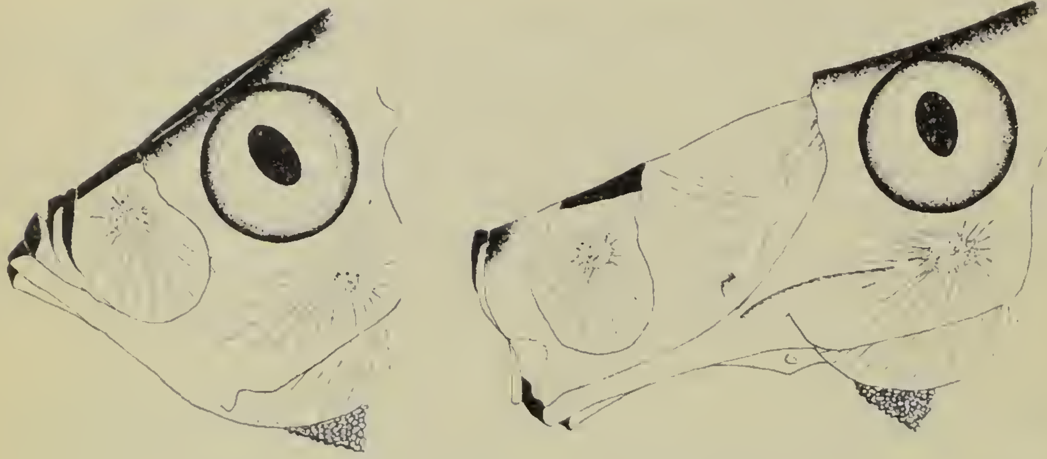
Total body length (excluding tail root and caudal fin) 78 inches.
Greatest body depth 16 inches at 27.5 inches from the snout.
Anus 44.5 inches from snout.
Centre of eye (2.6 inches in diameter) 5.1 inches from snout.
Lateral line commences 0.8 inches above and behind eye and remains central and parallel to the dorsal margin of the body, until the posterior end of the body is reached, where it dips slightly and curves up to the root of the caudal fin. The lateral line

armed with low, forwardly pointing spines which at the centre of the body are at a constant spacing of one inch.

FINS

Pectoral fins originate 10.6 inches from snout and consist of 10 rays, of which the 5th is the longest (3.2 inches); colour pink.

Dorsal fin of 155 rays (several others are missing) and with a maximum height of 6 inches; colour crimson.



Arctic Dealfish, *Trachypterus arcticus* Brunn.
Head with mouth mechanism in normal retracted position (left) and extended (right)

On 27th September, the first of a series of Ray's Sea Bream, *Brama raii* (Bloch), was trawled off Scarborough. Subsequent to this date, a further 14 specimens have been taken at Scarborough, of which 12 have been preserved in the Museum. Many other specimens have occurred, not only on the Yorkshire coast but on the greater part of the east coast south to Norfolk. The dates of capture, weights and lengths of the Scarborough specimens are shown below. An additional four specimens were taken to the north of Scarborough (personal communication from Dr. J. S. Gray, Wellcome Marine Laboratory, Robin Hood's Bay), viz.: one from Staithes, one from Sandsend and two from Whitby, all taken during the second week of November.

*27 September	One trawled off Scarborough and slightly damaged. Weight 3 lb. 4 oz., total length 21.3″.
*17 October	One stranded in the South Bay, Scarborough and very much mutilated by gulls. Weight undeterminable, total length 22.0″.
*25 October	One stranded in the South Bay. Weight 6 lb. 4 oz., total length 22.7″.
* 8 November	One stranded at Scalby Ness. Weight 5 lb. 6 oz., total length 21.7″.
*10 November	One trawled off Scarborough. Weight 4 lb. 12 oz., total length 21.5″.
*11 November	One stranded at Scalby Ness. Weight 5 lb. 7 oz., total length 23.3″.
*13 November	One caught on rod and line at Jackson's Bay, two miles north of Scarborough. Weight 5 lb. 2 oz., total length 23″.
14 November	One trawled by the keel-boat *Onward Star* but thrown overboard. The skipper and his crew had never seen a specimen before, and had only recognised the fish as a Ray's Sea Bream after seeing a photograph of one of the above specimens in the local newspaper.
*16 November	Two specimens, both stranded in the South Bay. One of these preserved in the Museum is 23.0″ long and 5 lb. 2 oz. in weight. The second specimen, 21″ long, is now preserved in a school at Filey.
*20 November	One stranded in the South Bay. Weight 5 lb., total length 23″.
24 November	One stranded in the North Bay, but in a very mutilated condition, and hence this specimen was not retained.
*28 November	One stranded in the North Bay, weight 4 lb. 4 oz., total length 21.3″.
*30 November	One stranded in the North Bay. Weight 4 lb. 8 oz., total length 22″.
*11 December	Trawled off Scarborough. This specimen escaped my notice at the Fish Market but was found later in a local shop. Weight 5 lb. 4 oz., total length 23.3″.

Those specimens marked with an asterisk are now preserved in the Museum.

The last very large influx of this species into our area was in 1928, when it was reported in *The Naturalist* for that year by W. J. Clarke. The reason for the 1967 invasion is rather obscure, but is probably due to an abnormally large influx of Atlantic water into the North Sea during 1967. Dr. A. Wheeler of the British Museum, informs me that *Brama raii* has been taken all along the east coast from Scottish waters to Norfolk and this, together with the recording of several other *Trachypterus* and two turtles of the genus *Dermochelys* in the North Sea, shows that the influx was made from the north. It is interesting to note that W. J. Clarke failed to find any remains of food in the stomachs of the Ray's Breams that he examined. I have examined the stomachs of all those preserved at Scarborough and have met with practically the same result, only two of the twelve specimens yielding any stomach contents. These consisted of two almost completely digested fishes, about 3 – 4″ long, of which only the vertebral columns remained, and they were found in the specimens of 13th and 16th November (caught on rod and line in Jackson's Bay and stranded in the South Bay after rough seas, respectively).

Other evidence of the abnormal influx of Atlantic water into the North Sea is shown by the capture of a specimen of a flying fish, *Cypselurus lineatus* (C. & V.) by a herring drifter operating off the east coast in late September. It was only by an unusual stroke of luck that this specimen came into my possession, since none of the fishermen or mongers who had seen it realised that it was a flying fish, or in fact an unusual fish! As far as I am aware, the only previous record for a flying fish on the Yorkshire coast is the specimen found upon the beach at Whitby in 1894 and noted by Thomas Stephenson in *The Naturalist* 285, 1894. This specimen is at present being examined by Dr. A. Wheeler, and may prove to be new to the British List. The measurements of the second specimen are as follows:

Total length (from the lip to tip of caudal fin)	16.5 inches.
Total span of pectoral fins when outstretched	19.25 inches.
Length of each pectoral fin	8.75 inches.
Length of each ventral fin	3.4 inches.

Dorsal fin: height 1.65 inches, basal length 2.0 inches.
Anal fin: greatest height 0.7 inches, basal length 1.4 inches.
Caudal fin: length of upper lobe 2.5 inches, lower lobe 3.25 inches.

Another southern species that has been brought into Yorkshire waters is the Black Sea Bream or Old Wife, *Cantharus lineatus* (Mart.), last recorded for Yorkshire in 1936, previous to which there are only five or six other records, viz.: one or two caught off Speeton about 1870, and noted in the *Handbook of Yorkshire Vertebrata*; two in December 1910, one on 26th January 1932, one 1st October 1934, one 27th October 1936, all trawled off Scarborough and noted by W. J. Clarke. During November and December 1967 five examples of this species were caught:

One trawled ten miles E.N.E. of Scarborough by the *Progressive* on 11th Nov.
One trawled on 20th November by the *Our Margaret.*
One trawled on or about 23rd November.
One trawled by the *Hyperion* on 24th November.

The last specimen was kept alive for me by the crew and when lifted from the water exhibited a brilliant pink reflection which had not been seen in the other, dead specimens. These four specimens are the only examples I have seen and all have now been preserved, but doubtless several others have been landed and have escaped my notice, since I was informed by a local fishmonger that he had had a specimen in his shop sometime during the first week in December, but that he had later thrown it away. The Black Sea Bream is not uncommon on our south and south-west coasts, but its occurrence as far north as this, and on the east coast, is very unusual.

On 19th December, the *F. & S. Colling* trawled a small fish about five inches long which, in the bad light of the fish pier and with my interest more in some invertebrates that had also been trawled that day, I took to be a Viviparous Blenny. The next day the fish was dead and I decided to preserve the specimen, but on lifting it up for closer inspection, I noticed that it was not a Viviparous Blenny but a near and supposedly quite rare relative known as the Crested or Yarrell's Blenny, *Chirolophis galerita* Linn. This little fish is stated by W. J. Clarke to be very rare, but this I think is an exaggeration. The chief identification feature of the Yarrell's Blenny lies in the presence of four soft processes upon the head. If the fish is examined out of water, these processes lie close to the head and are difficult to detect and hence there is a risk of the specimen being passed off as a Viviparous Blenny. Doubtless this has happened to specimens found on the coast in years past.

Three days after the capture of the above, the *F. & S. Colling* brought me another small fish, the Four Horned Cottus, *Cottus quadricornis* Linn. This species is certainly not common and we have only four previous records from Scarborough; in February 1905 and 1908, September 1926 and January 1928.

Other notable fishes recorded during 1967 are:

Three-spined Stickleback (*Gasterosteus aculeatus* L.)

One specimen was found in a rock-pool in Burniston Bay on 3rd July. This specimen could have been washed into the area from the rivers and streams entering the sea, and which were considerably swollen during the May floods.

Lesser Fork-beard (*Raniceps raninus* (L.))

A specimen, 11 inches long, was taken in a crab-pot off White Nab on 28th July.

Pogge (*Agonus cataphractus* (L.))

This species is obviously common off the coast, and I have had specimens on the following dates:

23rd May, one specimen, trawled; 24th November, one specimen from the *F. & S. Colling*; 11th December, one trawled by *Caroline*; 12th December, one trawled by the *Onward Star*; 13th December, one trawled by the *Onward Star*; 14th December, two trawled by the *Onward Star.*

John Dory (*Zeus faber* Linn.)

This species also appears to be fairly abundant, and I received eight specimens on the following dates:

15th, 20th and 29th November by the *F. & S. Colling*; 30th November by the *Hyperion*; 4th December by the *F. & S. Colling*; 11th and 12th December by the *Progressive*; 18th December by the *Sincere.*

Common or Müllers Topknot (*Zeugopterus punctatus* (Bloch))

One specimen, 8.7 inches long was trawled by the *Sincere* on 23rd November. This species is widely distributed around the British Isles, but the local fishermen claimed that they had never seen a specimen before.

Lesser Spotted Dogfish (*Scyliorhinus caniculus* (Linn.))

Two specimens of this species were seen, one on 23rd November trawled by the *F. & S. Colling*, and the second on 13th December by the *Onward Star.*

Common or Red Bream (*Pagellus centrodontus* (De la Roche))

One specimen was trawled by the *Onward Star* on 1st December, but the majority of the local fishermen did not know the true identity of the fish, some of them calling it a Red Mullet.

Porbeagle Shark (*Lamna cornubica* (Gmelin))

I know of two specimens of this common Yorkshire species having been landed. One was trawled off Flamborough Head on 28th October by the Bridlington keel-boat *Our Catherine*, and was obtained for the Scarborough Museum. A second specimen was landed at Scarborough by the *Sunningdale* on 20th November and was sold to a Grimsby firm for a rumoured sum of £6. The former specimen is 7 feet 1¾ inches long and weighed 241 lb.

"*Thresher Shark*" *at Whitby*

The report of a Thresher shark (*Alopias vulpes* (Gmelin)) in the *Scarborough Evening News* of 13th September is misleading, and Mr. R. S. Stephen, a Whitby chemist, claims that the creature he saw was certainly not a shark but a cetacean, breaking the water just outside Whitby harbour.

Poor Cod or Power (*Gadus minutus* Linn)

Although stated by Travis-Jenkins to be common all round the British Isles, the *Handbook of Yorkshire Vertebrata* gives no exact data for this species and after sixty years of observation at Scarborough, W. J. Clarke recorded only two specimens for our area. However, this species is definitely very abundant in our area and local boats land several dozen with every haul of the net, but due to their small size, they are invariably thrown overboard again.

It is worthwhile putting on record the occurrence of two specimens of the Striped-bellied Tunny in the Salmon nets in Filey Bay in the summer of 1965 or 1966. This species, also known as the Bonito (*Thynnus pelamys*, Cuvier and Volenciennes), has only been taken on two previous occasions, at Whitby in 1882 and 1922.

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1968

CATTERICK BRIDGE V.C. 65 — 1st to 3rd June

Our first Field Meeting for the year was held at Whitsuntide with Catterick Bridge as a base. On the first day the Swale banks in the Easby Abbey district were examined, on the Sunday the Hornby Castle Estate was visited and on the Monday two different localities on the Swale banks below Catterick Bridge were investigated. Twenty-six members were present for the final tea and Meeting and sixteen Societies were represented. Dr. W. A. Sledge took the Chair. The landowners who had so kindly allowed us to visit their property and Mrs. J. Holloway the Divisional Secretary who had organised the weekend, were formally thanked by Mr. C. Simms.

Landforms (C. Simms): Saturday was spent in the well-wooded Swale valley above Catterick and below Richmond, Sunday in the rolling parkland of Hornby and Monday in the broad vale just below Catterick.

Above Catterick the Swale is deeply incised, exposing evidence of past glacial action and present scour; especially the work of the recent severe floods. The Yoredale rocks dip gently upstream and so there is a pattern of platforms and ledges of the more resistant components superimposed on a simple series of river terraces. The steep slopes between the various levels carry much of the woodland, those between the highest terraces are marked by lines of gorse; the higher terraces are arable where well-drained. There was a lot of freshly-deposited silt and cobbles, with a poor microscopic flora and fauna as yet, but richly colonised already by annual plants.

The parkland at Hornby Castle, landscaped but otherwise rather drumlinised glacial drift on Millstone Grit and Magnesian Limestone, includes a series of long-established lakes, including a once-famous but now disused duck decoy. Except about the lakes there is little woodland.

Below Catterick the braided Swale quickly widens, loses speed and drops some of its load. Regularly accreting floodsilt at Hollow Banks showed seasonal burrows of Rabbit and Water-Vole, an interesting adaptation to a habitat periodically flooded. Upstream of the constricting bluffs at Ellerton and Oran the river deposited a very wide spread of sand, gravel, cobbles and larger items during the March floods, and a large acreage of pasture and river scrub was flooded to a depth of several feet. Apart from a rich crop of transported and annual plants the newly-modified habitat was ideal for nesting Oystercatchers, Snipe and Willow Warbler in an otherwise sparse fauna.

Vertebrates (C. Simms): FISHES: Little attention was paid to these but Pike and Trout were present in at least one of the Hornby Castle park lakes, Dace and Minnow in the Swale at Catterick.

AMPHIBIANS: Ponds at Catterick had Smooth and Crested Newts. Common Toad larvae were abundant at Hornby although those of the Common Frog were very few.

REPTILES: A Slow Worm was found in felled and recently replanted woodland on the Hornby estate. This and the Common Lizard, in the ha-ha wall at Hornby, were the only reptiles recorded despite good conditions and visits to some favourable areas.

MAMMALS: Hedgehog road casualties and molehills were seen but a Common Shrew was the only species of Insectivore handled. Bats were not investigated. The meeting was a poor one for Carnivores, despite Mrs. Holloway recording an Otter above Catterick a few days before the meeting; a district where this species has since bred. Signs of Badger and of Fox were found, but nothing of the smaller species. The excavations for Cadbury's new premises at Catterick had exposed recent bones of Roe Deer. The Lagomorphs were well represented. Rabbits have already been mentioned and the Brown Hare was seen several times. The Rodents proved difficult to find or trap, and work elsewhere in areas affected by the severe spring floods indicated that most species had not re-established themselves by midsummer. The Wood Mouse (*Apodemus sylvaticus*), Brown Rat, Bank Vole, Water Vole and Field Vole were eventually found; the Rat by Mrs. Holloway and the Bank Vole by Mrs. Duncan. Water Voles were found only once, and their characteristic activities usually leave conspicuous signs.

Ornithology (A. C. M. Duncan): Catterick Bridge is situated on the Swale in the lower part of its valley. This provided habitats of riverside, farmland and parkland. In addition, gravel working produced a man-made environment suitable for waders. An interesting report came to us that Little Ringed Plover were nesting on the gravel pits. Oystercatchers were seen to be nesting there also and Redshank were heard.

Blackheaded and Herring Gulls and a Heron were seen flying up the river and a colony of Sand Martins were nesting in the river bank. Swallows and House Martins were quite abundant and Swifts were also seen. Yellow Wagtails were seen in the meadows adjoining the river and Grey and Pied Wagtails and Dippers were also seen. Tree Sparrows were noted.

In the woods near Easby, Wood Warblers were heard singing, as were Garden, Willow and Grasshopper Warbler, Blackcap and Whitethroat. Reed Bunting, Corn Bunting and Yellowhammer were heard up the riverside.

Hornby Castle was a parkland area providing various habitats. Its lakes gave us waterbirds such as Mute Swan, Mallard, Coot and Sedge Warbler. The plantations held Pheasant. In the park were Goldfinch, Greenfinch, Chaffinch, Bullfinch, whilst Lesser Redpoll were heard chattering overhead. Great, Blue, Coal, and Long Tailed Tits were seen and a Chiffchaff was heard singing.

Jackdaw, Rook and Carrion Crow were recorded during the weekend as was a Kestrel. Five Canada Geese were seen flying over.

A total of 68 birds were recorded during the weekend.

Other species recorded were: Moorhen, Lapwing, Redshank, Common Sandpiper, Curlew, Snipe, Wood Pigeon, Turtle Dove, Cuckoo, Skylark, Great Spotted Woodpecker, Tree Pipit, Meadow Pipit, Wren, Dunnock, Blackcap, Whitethroat, Pied Flycatcher, Redstart, Robin, Blackbird, Song and Mistle Thrush, Linnet, Redpoll, House Sparrow, Starling and Magpie.

Vascular Plants (W. A. Sledge, C. M. Rob and Joan Duncan).

SATURDAY (W.A.S.): The route was down the river from Easby Abbey thence over the railway bridge continuing down stream on the wooded south bank and then over pasture and open ground by the river. Soon after departure *Gagea lutea* (Yellow Star-of-Bethlehem) was seen — or its remains — and one of the stations for *Epipactis leptochila* (Helleborine) was visited but no shoots were yet above ground. *Geranium sylvaticum* (Wood Cranesbill) was in good flower and a notable feature of this outing was the abundance of *Stellaria nemorum* (Wood Stitchwort) which both here and elsewhere in the Richmond area (it was seen again in plenty on Monday) occurs in great quantity. *Cardamine amara* (Large Bitter-cress), *Ranunculus auricomus* (Goldilocks), *Saponaria officinalis* (Soapwort), *Myrrhis odorata* (Sweet Cicely), pistillate plants of *Petasites hybridus* (Butterbur), *Poa nemoralis* (Wood Poa) and *Milium effusum* (Wood Millet) were amongst other species seen.

The most interesting species encountered during the course of the day was *Vicia sylvatica* (Wood Vetch). This was seen by the path in the wood on the south bank of the river. It was recorded by Miss Rob from Park Wood in 1943, probably from a different part of the wood, and the entry in the *Atlas* is doubtless based on this record. The better known locality at Whitfield Gill, Askrigg is however surprisingly omitted from the *Atlas*. *Prunus padus* (Bird Cherry), *Crepis paludosa* (Marsh Hawk's Beard), *Veronica montana* (Wood Speedwell), *Lathraea squamaria* (Toothwort), *Festuca gigantea* (Tall Brome) and *Equisetum telmateia* (Great Horsetail) were other species noted here. The open ground beyond the wood did not yield many species of interest, *Ophioglossum vulgatum* (Adder's Tongue Fern) and *Saxifraga granulata* (Meadow Saxifrage) being the only ones worthy of note.

SUNDAY (C.M.R. and J.D.): The excursion to Hornby Castle Estate provided an opportunity of visiting an area not normally accessible to naturalists and previously unexplored even by local botanists. The ground included parkland, woodland and a lake, and though much of the parkland had been ploughed some interesting terrain was covered and a number of additions to the 10 km. square were made. The most interesting area was the lake in which *Hippuris vulgaris* (Mare's-tail) was abundant with smaller quantities of *Ranunculus trichophyllus* (Water Buttercup) and *Hottonia palustris* (Water Violet). A dozen different sedges were seen here and elsewhere in the park and woodland. The best plant found was *Scrophularia umbrosa* (Shade Figwort). Over 200 species were noted in the course of the day, the following being additions to the 10 km. square 44/29:

Asplenium trichomanes
Polypodium vulgare
Carex lepidocarpa
C. rostrata
Helictotrichon pubescens
Hippuris vulgaris
Lemna trisulca
Listera ovata
Ranunculus trichophyllus
Scrophularia umbrosa
Taraxacum laevigatum
Valeriana officinalis

The following planted species were also noted in the park: *Alnus incana, Lonicera xylosteum, Mahonia aquifolium, Polygonum cuspidatum* and *Vinca major.*

MONDAY (W.A.S.): This excursion took us first to rough open ground on the north bank of the Swale half a mile below Catterick Bridge. Here *Minuartia verna* (Spring Sandwort) was seen in plenty amongst short turf and bare ground. Other low-lying localities for this species in Yoredale, Nidderdale and Wharfedale have been recorded but all appear to be based on isolated plants which have evidently been washed down from higher up the rivers and which have become briefly established in their recorded sites. Such records of casual and temporary occurrences are of little significance in determining permanent distribution. The Catterick locality which is situated at only 150 ft. O.D. and where the plant has been known for more than 20 years is therefore of particular interest.

Other species seen on or about the same ground were *Botrychium lunaria* (Moonwort) one plant, *Saponaria officinalis* (Soapwort), *Cerastium semidecandrum* (Little Mouse-ear Chickweed), *C. arvense* (Field Mouse-ear Chickweed) and *Galium mollugo* (Hedge Bedstraw). Later, the river bank below Catterick village was visited and here in damp shrubby ground and on extensive open disturbed gravelly areas the following were seen: *Cardamine amara* (Large Bitter-cress), *Stellaria nemorum* (Wood Stitchwort), *Hesperis matronalis* (Dame's Violet), *Reseda luteola* (Dyer's Rocket), *Lychnis alba* x *dioica* (Hybrid Campion), *Anthyllis vulneraria* (Kidney Vetch), *Myrrhis odorata* (Sweet Cicely), ♀ *Petasites hybridus* (Butterbur), *Echium vulgare* (Viper's Bugloss) and *Festuca gigantea* (Tall Brome).

Bryophytes (J. Robertson): No bryologists were present on the first two days and the report below covers only those plants found below Catterick Bridge, on the river banks, on the Monday.

In open grassland on the north bank of the Swale about half-a-mile below Catterick Bridge the species seen were *Pseudoscleropodium purum, Hypnum cupressiforme, Rhytidiadelphus squarrosus, Barbula convoluta, Thuidium philibertii* and *Rhacomitrium heterostichum,* and on bare earth round old rabbit burrows *Weissia microstoma,* in fruit.

On an old wall top near here occurred *Rhacomitrium canescens, Tortula muralis, Funaria hygrometrica, Ceratodon purpureus var purpureus, Grimmia apocarpa* and *G. pulvinata.*

Further downstream, amongst the stones in the shallower parts of the river grew *Fontinalis antipyretica, Cinclidotus fontinaloides* and *Eurhynchium riparioides* and on the banks amongst the shade of old tree roots: *Mnium punctatum, M. hornum, M. undulatum, M. stellare, Cratoneuron filicinum, Amblystegium serpens, Leskea polycarpa, Brachythecium rutabulum, Drepranocladus uncinatus, Eurhynchium praelongum, E. swartzii, Isothecium myosuroides* and the hepatics *Pellia epiphylla, Conocephalum conicum, Lunularia cruciata* and *Calypogeia arguta.*

HACKFALL AND MICKLEY WOODS V.C. 64 — 8th June

Two parties explored this wooded part of the Ure valley, one starting from Mickley and the other from Hackfall. The weather was gloriously sunny and twenty-seven members, representing thirteen Societies, were present. Dr. Sledge took the Chair at the meeting for reports after tea, and Miss Gunningham expressed the thanks of the Union to the landowners who had granted access to their land, and to Miss H. Lefèvre, the Divisional Secretary, who had organised the excursion.

Vascular Plants (W. A. Sledge): The slopes of the River Ure from Mickley upwards to Hackfall are well wooded. Some clearance of trees has been effected at the Mickley end of the woods and here tall undergrowth soon forced the party which started from this end to ascend from the riverside to the track near the top of the slope. Although some evidence of calcareous soils was seen at the crest of this slope nearly all the ground traversed was siliceous as evidenced both by the rocks exposed and the flora.

Soon after leaving Mickley *Pyrola minor* (Wintergreen) and nearly a score of plants of *Neottia nidus-avis* (Bird's-nest Orchid) were seen. *Carex pendula* and *Equisetum telmateia* (Great Horsetail) were also seen here. Other species noted were *Ophioglossum vulgatum* (Adder's Tongue), *Polystichum aculeatum* (Hard Shield-fern), *Cardamine amara* (Large Bittercress), *Myosotis sylvatica* (Wood Forget-me-not), *Scrophularia aquatica* (Water Figwort), *Veronica montana* (Wood Speedwell), *Galium odoratum* (Woodruff) and *Festuca gigantea* (Tall Brome).

Nearer Grewelthorpe the woods have been less subject to interference. Much of the ground flora is indicative of base-deficient soils with Bluebell, Greater Woodrush, Honeysuckle, Male Fern, Lady Fern and Broad Buckler-fern abundant. A notable species here was *Polystichum setiferum* (Soft Shield-fern). Though previously known to occur here I have seen it in only one other station in West Yorkshire. Two other rare species previously recorded from Hackfall, *Carex strigosa* and *Festuca altissima* were also seen. The former, which I first saw at Hackfall in 1924 has only three or four other stations throughout the county. The *Festuca* is unrecorded in the *Atlas* for 44/27, although the entry for 44/37 is an error for this square. Another plant seen in the Grewelthorpe section of the wood, which is also unrecorded in the *Atlas* for this square, was *Menyanthes trifoliata* (Bogbean) which was abundant in a pool at the Mickley end of the wood. Other plants seen included *Ranunculus auricomus* (Goldilocks), *Stellaria nemorum* (Wood Stitchwort), *Geum intermedium* (Hybrid Avens), *Prunus padus* (Bird Cherry), *Myrrhis odorata* (Sweet Cicely), *Crepis paludosa* (Marsh Hawk's-beard), *Lathraea squamaria* (Toothwort) and *Milium effusum* (Wood Millet).

Bryophytes (F. E. Branson): Following the meeting of the Bryological Section at Hackfall on 3rd April 1965, when the area was thoroughly investigated, a list of all the species found appeared in *The Naturalist* 104–5, 1965. Although the route taken on this excursion was almost identical with that of the previous occasion, i.e. from the road down to the river Ure following the path parallel with the stream and parts of the banks of the stream, one hepatic and twelve mosses were added to that list. It is most interesting to compare lists of species found when revisiting an area. One very small species we were pleased to refind was *Zygodon viridissimus* (Dicks.) R. Br. on a branch reaching across the path. I also saw *Dicranum montanum* Hedw. in the original position and in several other places too, some quite large patches of it being on the trunk of a fallen tree stretching over the stream. Mr. Shaw also reported an abundance of *Tetraphis browniana* (Dicks.) Grev. on rocks at the side of the river Ure, another location from that mentioned in the previous report.

Hackfall is interesting historically as it was here that *Cynodontium bruntonii* (Sm.) B. & S. was first gathered in 1801 by W. Brunton (of Ripon), after whom it was named by Bruch and Schimper. Although we had it in mind, we have not been able to refind it.

The new species found are as follows:

HEPATICAE

Lophocolea heterophylla (Schrad.) Dum., on tree branches.

MUSCI

Hygrohypnum luridum (Hedw.) Jenn. on wet ground by the side of the path;
Barbula spadicea (Mitt.) Braithw. on rocks by the Ure;
Barbula convoluta Hedw. on a wall near Hackfall;
Barbula cylindrica (Tayl.) Schimp. on a tree root near the river Ure;
Bryum pallens Sw. in several places on rocks above the river Ure;
Isothecium myurum Brid. on a fallen tree stretching across the stream. I made a special note in the previous report that this was not seen in Hackfall, but *Isothecium myosuroides* Brid. occurs far more commonly there.
Cinclidotus fontinaloides (Hedw.) P. Beauv. on wet rocks by the river Ure;
Fontinalis squamosa Hedw. on wet rocks by the river Ure;
Fissidens minutulus (*F. pusillus, sensu stricto*) on wet rocks by the river Ure;
Mnium marginatum (With.) D. Beauv. *var. marginatum*, on a rocky ledge above the river Ure;
Pohlia delicatula (Hedw.) Grout, on wet, dripping rocks above the Ure; and
Grimmia apocarpa Hedw. on rocks above the river Ure.

CAYDALE, Near HAWNBY V.C. 62 — 15th and 16th June

The weather for these two days in north-east Yorkshire was excellent throughout. Members met in Helmsley and travelled to Caydale by car each day, spending the Saturday in the vicinity of Caydale Mill and the Sunday in Deep Gill Wood.

At the tea and meeting at the Feathers Hotel, Helmsley, eleven Societies were represented. The Chair was taken by Miss C. M. Rob.

A vote of thanks to Mr. Lawrence the Divisional Secretary and to the landowners who had so kindly given us permission to visit their property, was given by Mrs. J. Graham.

Landforms (C. Simms): This meeting was concerned with the exploration of Caydale and, especially, its northern wooded tributary Deep Gill. The heads of these sinuous, steep-sided valleys clearly suggest a subglacial origin; the characteristically steep valley sides and rather flat, badly drained floors have sheltered and preserved some very interesting plants.

The rock here is mainly calcareous and the upland plateau shows only a thin soil, but soil conditions in Caydale and Deep Gill are clearly more complex except on the steeper slopes. Postglacial rejuvenation, producing a valley-in-valley form below Caydale Mill, has provided a contrast between the lower valley — choked with glacial, alluvial and landslipped valleyside debris which the stream is incompetent to work — and thin limestone pastures on the little-modified subglacial wall and floor surfaces upstream. Generally, the former has very mixed soils with some rather acid flashes and the latter, little-examined during the meeting, basic and more exposed conditions.

Vertebrates (C. Simms): Other contributors were Messrs. Alderson (16th) and Appleby (15th) and, as usual, some valuable records came from the botanical party. The recorder was not resident in the area for the meeting and undertook no trapping.
FISHES. The Stone Loach and the Minnow were found in Caydale Beck, but Trout and Sticklebacks were not determined as to the species present.
AMPHIBIANS. Common Toad tadpoles were very numerous at Caydale Mill (and preyed on by a Water Shrew) and a single Common Frog was seen in Deep Gill Wood. These were the only records despite very favourable conditions and the frequency of Slow Worms in the area generally.

BIRDS. A good list owed a great deal to R. Appleby's work on 15th. The only raptor seen was a Kestrel, but game birds were frequent (Common Partridge, European Quail and Pheasant all had chicks). Lapwing and Woodcock were the only waders encountered. Most of the other species were seen in Deep Gill Wood: Stock Dove, Woodpigeon, Cuckoo, Nightjar, Swift, Green Woodpecker, Great Spotted Woodpecker, Skylark, Swallow, House Martin, Carrion Crow, Rook, Jackdaw, Great Tit, Blue Tit, Long-tailed Tit, Nuthatch (breeding), Tree-creeper, Wren, Song Thrush, Blackbird, Whinchat, Redstart, Robin, Sedge Warbler, Blackcap (breeding), Garden Warbler, Whitethroat (abundant), Willow Warbler, Spotted Flycatcher, Dunnock, Tree Pipit, *alba* Wagtail, Grey Wagtail, Starling, Greenfinch, Goldfinch, Linnet, Redpoll, Bullfinch, Chaffinch, Yellowhammer, Corn Bunting, Reed Bunting, House Sparrow and Tree Sparrow. R. Appleby remarked (*in litt.*) on the relative scarcity of warblers, except Whitethroat, and the apparent absence of Chiffchaff.
MAMMALS. Hedgehog, Mole, Common Shrew and Water Shrew made up the recorded Insectivores. Carnivores were few, apart from tracks of Badger and Fox. Mrs. and Miss Robertson saw a Weasel and Mrs. Thompson a Stoat. Rabbits were present in a few places and Grey Squirrels in Deep Gill Wood, but the only small rodents named (from corpses) were the Wood Mouse and the Field Vole.

Entomology (R. Crossley): In spite of glorious weather on the Sunday, few insects were in evidence. Collecting was chiefly confined to the area near the stream in Deep Gill and the list of species found is unfortunately a rather meagre one.
The common hover-fly *Xylota segnis* L. was numerous in the vicinity of decaying tree stumps and one such stump was also attracting numbers of the common carrion beetle *Hister striola* Sahlb. The carrion beetle *Oeceoptoma thoracicum* (L.) was taken in the same locality. The common large longhorn beetle *Rhagium mordax* (D.G.) was taken and also two specimens of *Oedemera virescens* L. The latter is a lovely slender green beetle about half an inch long. It is a very rare insect but it is known to occur in these valleys, and this is the only known area for it in the north of England. Miss Robertson handed me a specimen of the brightly attractive beetle *Sermylassa halensis* (L.) which is a rather local insect and worth noting.

The marsh vegetation by the stream, where it was dominated by *Filipendula ulmaria* produced good numbers of a capsid bug very near to *Lygus pratensis* L. As there has recently been a revision of this critical complex the specimens will provide useful material for further study.

A single specimen of the hover-fly *Pyrophaena rosarum* Fab. was interesting. This is a very local species, at least in the north, and this constitutes the first record for V.C. 62.

I am grateful to Mr. J. H. Flint and Mr. P. Skidmore for identifying the beetles, and to Mr. Flint for comments on their distribution.

Flowering Plants (J. Holloway and C. M. Rob): Not only has the Yowlass-Murton valley been visited by the Union twice in the last 50 years, but this particular 10 km. square is probably one of the best worked areas in V.C. 62.

Since the last visit by the Y.N.U. in 1953 there have been a number of changes, the one affecting the flora to a large extent is the afforestation of the lower end of the valley, with the making of wide roads and deepening of the existing streams, and this weekend has shown the need for constant work in areas which, on paper seem to have been well explored and recorded.

Perfect weather added to the enjoyment of the meeting; the ground worked provided a good variety of habitats, acid moorland on the hill tops, scrub, woodland, marshy stream sides, calcareous flushes, rough grazing, forest rides, with a little arable and new ley pasture. A feature of this, along with other nearby limestone valleys, is the trees of *Acer campestre* (Field Maple), which are really big trees in the old woodland, a complete contrast to those more often seen in the lowland hedgerows. Close to Murton Grange farm a very large stand of *Myrrhis odorata* (Sweet Cicely) may well be a relic of the time when this plant was cultivated for use as a cattle spice. *Pinguicula vulgaris* (Butterwort) was very abundant in most of the calcareous marshes as was *Valeriana dioica* (Marsh Valerian) while *Trollius europaeus* (Globe-flower) and *Carex dioica* were noted in at least two places. *Carex lepidocarpa* was in several places near the junction of the Deepgill beck and the main stream; *Melica nutans* and *Aquilegia vulgaris* (Columbine) were seen on the first day when the Caydale Mill area was examined. Here the ground is more open. Lower down most of the woodland was very dense; Deepgill was almost impassable with far too many stinging nettles for comfort. *Geum intermedium* was very plentiful at the low end of Deepgill, along with both *Geum urbanum* (Wood Avens), and *G. rivale* (Water Avens).

Along the newly cut forest road *Veronica officinalis* (Common Speedwell) made a fine show, some clumps being about 3 ft. across and a mass of mauve flower. *Trifolium medium* (Zigzag Clover) was also very abundant, more so in fact than any other species of this genus. New Zealand Willowherb has now arrived in this valley, a fair-sized patch being noted on the first day near the mill.

In all, eight plants were added to the 10 km. square SE 5/9 bringing the total to 548. The additional species are *Ononis repens* (Rest Harrow), *Potentilla anglica* (Tormentil), *Spergula arvensis* (Corn Spurrey), *Salix aurita* (Eared Sallow), *Dactylorchis maculata* (Spotted Orchid), *Taraxacum palustre*, *Valeriana officinalis* (Common Valerian) and *Epilobium nerterioides* (New Zealand Willowherb).

There is no doubt this valley should be visited by the Union at fairly frequent intervals and a record of the changes published, for although at the present time most of the plants recorded in the past survive, their future is very uncertain.

Bryophytes (J. Robertson): Although conditions were very dry about 60 species of bryophytes were collected, all of them fairly common and typical of their habitats.

On dry, limestone walls in various parts of Caydale occurred quantities of *Grimmia apocarpa* and *G. pulvinata, Tortula muralis* and *T. ruralis, Camptothecium sericeum, Neckera crispa* and *N. complanata, Tortella tortuosa, Orthotrichum anomalum, Funaria hygrometrica* and in one site only, the hepatic, *Frullania tamarisci*.

On bare earth banks beside the road above Caydale Mill *Weissia microstoma* was fruiting profusely in a number of places with *Barbula unguiculata* and on sandy soil between young conifers on the hill top; also *Polytrichum juniperinum, Dicranella heteromalla* and *Pleuridium subulatum*.

On numerous tree boles in Deep Gill grew *Metzgeria furcata, Bryum capillare, Dicranowcissia cirrata, Orthodontium lineare* and *Ceratodon purpureus var. purpureus.*

Various limestone exposures on the hillsides supported *Ctenidium molluscum, Camptothecium lutescens* and *Diplophyllum albicans.*

Typical open woodland mosses found were *Tetraphis pellucida, Mnium hornum, M. undulatum, M. stellare, Plagiothecium undulatum, P. succulentum, Dicranum scoparium, Amblystegium serpens, Eurhynchium striatum, E. praelongum, Isothecium myosuroides, Cirriphyllum piliferum, Thuidium tamariscinum, Thamnium alopecurum* and the hepatics *Plagiochila asplenoides var. major, Calypogeia arguta* and *Lophocolea bidentata.*

In the open grassland some common species were: *Rhytidiadelphus squarrosus* and *R. triquetrus, Acrocladium cuspidatum, Brachythecium rutabulum, Pseudoscleropodium purum* and *Pleurozium schreberi.*

In the alkaline Caydale Beck, *Cratoneuron filicinum, C. commutatum* and *Conocephalum conicum* occurred frequently.

In the bog just below Caydale Mill, which appeared to have both acid and alkaline flushes, we found *Philonotis calcarea, Fissidens adiantoides* and *F. taxifolius, Dicranum bonjeanii, Climacium dendroides, Pohlia nutans, Mnium punctatum, Acrocladium cordifolium, Polytrichum commune* and *Riccardia pinguis.*

BRETTON PARK AND STOCKSMOOR COMMON V.C. 63

6th July

Again in brilliant sunshine members enjoyed a morning in Bretton Hall Park and the afternoon on Stocksmoor Common.

Thirty-seven members, representing fourteen Societies, were present at the meeting for reports after tea, when Mr. R. Atkinson took the Chair. Miss J. Robertson expressed the visitors' thanks to the landowners who had so readily granted us access, to the ladies of the Barnsley Naturalists' Society who had provided the tea and to the Divisional Secretary, Mr. R. Crossley, who had organised the day's programme.

Ornithology (C. Disbrey): The following birds were seen during the day:

BRETTON PARK

Great Crested Grebe, Mallard, Canada Goose, Kestrel, Moorhen, Coot, Lapwing, Lesser Black-backed Gull, Black-headed Gull, Stock Dove, Wood Pigeon, Turtle Dove, Swift, Skylark, Swallow, House Martin, Sand Martin, Carrion Crow, Rook, Jackdaw, Magpie, Jay, Great Tit, Blue Tit, Wren, Mistle Thrush, Song Thrush, Blackbird, Redstart, Robin, Blackcap, Garden Warbler, Whitethroat, Willow Warbler, Chiffchaff, Spotted Flycatcher, Hedge Sparrow, Starling, Greenfinch, Goldfinch, Linnet, Chaffinch, Yellowhammer, Reed Bunting, House Sparrow, Tree Sparrow.

STOCKSMOOR COMMON

Kestrel, Lapwing, Lesser Black-backed Gull, Wood Pigeon, Swift, Skylark, Swallow, Rook, Great Tit, Blue Tit, Wren, Blackbird, Grasshopper Warbler, Whitethroat, Hedge Sparrow, Tree Pipit, Starling, Linnet, Redpoll, Chaffinch, Reed Bunting, Yellowhammer.

Entomology (J. H. Flint): The day was ideal for entomologists and in Bretton Park there were plenty of insects although most of these were the common species of woodland and grassland. The bugs (Hemiptera) to be expected on oak, lime, alder and so on were duly taken. Butterflies were scarce but five species were noted. Several Chimney-sweeper moths (*Odezia atrata* L.) flew out of a small area of long meadow grass but the most noticeable species were the 'longhorn micro-moths' *Adela degeerella* L. which were plentiful on the margins of the woodland. Hoverflies were active and the quantity of *Xylota sylvarum* L. was a feature of the riverside woodland. *Merodon equestris* F., *Volucella pellucens* L. and other large species were seen but the only noteworthy fly was a *Xylota nemorum* F. taken by Mr. Crossley.

Sawflies were scarce and most of those taken remain to be identified later but three rather local species were *Tenthredopsis litterata* Geoff., *Tenthredo scrophulariae* L. and *T. colon* Klug. Solitary bees also were scarce but there were a few wasps, the small black species of *Crossocerus* moving very rapidly in the hot sunshine. Wasps taken were *Passaleucus monilicornis* Dahl. (new to V.C. 63), *Crossocerus confusus* Schulz (the first Yorkshire record), *C. dimidiatus* F., *C. elongatulus* Lind., *C. varius* Lep., *Pemphredon lugubris* Lat. and *Argogorytes mystaceus* L. The beetles consisted similarly of common species and included the soldier beetles *Cantharis fulvicollis* F. and *Malthinus flaveolus* Pk., the striking black and yellow longhorn *Strangalia maculata* Poda and *Antherophagus nigricornis* F. The curious slug-like larvae of *Cionus scrophulariae* L. were devouring the leaves of the figwort (*Scrophularia nodosa*).

The upper lake, the only one visited, was unproductive except at the marshy top end where the water-beetles were collected by Jeremy Flint. Even here the number of species was not large and included some larvae of *Dytiscus* and adults of *Agabus bipustulatus* L., *A. sturmii* Gyll., *Ilybius fuliginosus* F., *I. ater* Deg., *I. obscurus* Marsh. and *I. subaeneus* Er., this being the fourth Yorkshire station for the last named and it was plentiful here. The reed-beetle *Donacia simplex* F. was common on the *Sparganium*. No larger dragonflies were seen but there were plenty of the smaller damsel-flies at this spot, *Ischnura elegans* Lind., *Coenagrion puella* L. and *Pyrrhosoma nymphula* Sulz.

During the afternoon two of the entomologists visited Stocksmoor but this was very unproductive, the only insects worth noting being the fly *Volucella bombylans* L. and the Forester moth (*Procris statices* L.).

Vascular Plants: The party was favoured with ideal weather conditions and although the small group of botanists present only investigated a small area of the park this covered various types of habitat, including grassland, woodland, waterside and some cultivated land. One of the features of the park was the amount of regeneration taking place in the wooded areas of both native and introduced species of trees. Especially conspicuous were thickets of Hornbeam saplings of various ages, mature trees of the species being laden with fruit. Of the many fine planted trees the Tulip tree (*Liriodendron*) bearing a magnificent crop of flowers was perhaps the most conspicuous.

A hundred and fourty-four species were recorded, almost all of which were plants of wide distribution. The following species may be mentioned:

Ranunculus sceleratus (Celery leaved Crowfoot), *Rorippa islandica* (Marsh Yellow Cress), *Hypericum perforatum* (St. John's Wort), *H. tetrapterum* (Square-stalked St. John's Wort), *Spergularia rubra* (Sand Spurrey), *Potentilla anglica* (Tormentil), *Epilobium roseum* (Pale Willowherb), *Myriophyllum* sp. (Water Milfoil) (seen out in lake but out of reach), *Callitriche intermedia* (Water Starwort), *Polygonum amphibium* (Amphibious Bistort), *Scophularia aquatica* (Water Figwort), *Scutellaria galericulata* (Skullcap), *Succisa pratensis* (Devils Bit Scabious), *Senecio erucifolius* (Hoary Ragwort), *Petasites hybridus* (Butterbur), *Potamogeton crispus* (Curled Pondweed), *Juncus inflexus* (Hard Rush), *Lemna trisulca* (Ivy Duckweed), *Carex nigra* (Common Sedge), *C. hirta* (Hairy Sedge), *C. echinata* (Star Sedge), *C. remota* (Remote Sedge), *Bromus ramosus* (Hairy Brome), *Trisetum flavescens* (Yellow Oat), *Milium effusum* (Wood Millet).

Leaving Bretton Park in the afternoon, the party then proceeded to Stocksmoor, where a fairly extensive survey was undertaken. Fourty-four species not recorded at Bretton were added to the list.

The Common provided habitats for plants of Birchwood, grassland of a rather dry type, and wetter areas. The latter situations supported quite large populations of the hybrid Woundwort (*Stachys* × *ambigua*) as well as an abundance of *S. palustris* and a smaller quantity of *S. sylvatica*, the parents. The various colonies of the hybrid varied considerably in breadth of leaf, length of petiole and colour of flowers.

An interesting find was a number of plants of *Veronica scutellata* (Marsh Speedwell) in a wet area but *Gnaphalium sylvaticum* (Wood Cudweed), known to be present there was not seen on this occasion.

Other species seen included the following: *Equisetum palustre* (Marsh Horsetail), *Ranunculus flammuula* (Lesser Spearwort), *Viola palustris* (Marsh Violet), *Lychnis flos-cuculi* (Ragged Robin), *Stellaria alsine* (Bog Stitchwort), *Impatiens parviflora* (Small Balsam), *Lotus uliginosus* (Greater Birdsfoot Trefoil), *Malus sylvestris* (Crab Apple), *Epilobium hirsutum* (Great Hairy Willowherb), *Hydrocotyle vulgaris* (Marsh Pennywort), *Galium palustre* (Marsh Bedstraw), *Gnaphalium uliginosum* (Marsh Cudweed), *Dactylorchis fuchsii* (Common Spotted Orchis), *Sieglingia decumbens* (Heath Grass).

The botanists left both places with the feeling that further search would produce other species and particularly the lakes at Bretton Park.

POCKLINGTON CANAL V.C. 61 — 20th July

The weather for this meeting was wet until lunchtime, but improved in the afternoon. The Divisional Secretary had arranged visits to a number of sites along the canal banks, which gave us some idea of the wide and interesting variety of its flora and fauna.

Thirty-seven members attended the meeting, representing seventeen Societies. Mr. R. F. Dickens took the Chair at the meeting for reports after tea. A vote of thanks to the landowners who had given us permission to visit their parts of the canal banks and to Mr. E. Chicken the Divisional Secretary who had made all the arrangements, was expressed by Mrs. K. G. Payne.

Ornithology (R. F. Dickens): General weather conditions probably resulted in a lower bird total than might otherwise have been listed but, on the other hand, possibly more species were in song in the damp, still conditions. The total number of species reported during the day was 49, of which 15 were in song.

The most notable records were of a female Shoveler at Canal Head, about thirty Mallard in eclipse below the lock between Eastfield House Farm and Toft Houses. A good colony of Reed Warblers was in the same area, Kestrels had young in the nest near Westfield Farm, Melbourne, and a family of recently fledged Kestrels were near Thornton, less than two miles to the east. Here five birds could be seen in the air together. A Short-eared Owl was quartering the ings beyond the beck north from Westfield Farm.

With the improvement in weather conditions later in the morning, a movement of Lapwings became evident. Flocks of four, twenty-seven, twenty-two, and one hundred and thirty flew W.N.W. within about half-an-hour near Westfield Farm and other flocks were seen in other areas. The final observation was a Swallow's nest, reported from the ladies toilet at the Barmby New Inn.

A full list of species, with S to indicate those in song, follows: Mallard, Shoveler, Kestrel, C. Partridge, Pheasant, Moorhen, Coot, Lapwing, Snipe, Black-headed and Common Gulls, Herring Gull, Wood Pigeon (S), Stock Dove, Turtle Dove, Short-eared Owl, Swift, Skylark (S), Swallow, House Martin, Yellow Wagtail, Pied Wagtail, Wren (S), Dunnock (S), Sedge Warbler (S), Reed Warbler (S), Garden Warbler (S), Whitethroat (S), Willow Warbler, Spotted Flycatcher, Robin, Blackbird (S), Song Thrush (S), Mistle Thrush, Marsh Tit, Blue Tit, Great Tit, Yellowhammer (S), Reed Bunting (S), Chaffinch, Greenfinch (S), Goldfinch (S), Linnet (S), Redpoll, House Sparrow, Tree Sparrow, Starling, Rook and Carrion Crow.

Entomology (K. G. Payne): Conditions for collecting insects were very far from good. Rain up till lunchtime left the vegetation very wet and glimpses of the sun in the afternoon were inadequate to get many insects flying. The Entomological Section was represented by Mr. R. Crossley, whose notes appear below, and by the writer. Mr. Crossley took one very interesting insect — by far the best of the day. Though detrimental in every other way, the wet conditions did serve to provide a very convincing demonstration of the virtues of a nylon chiffon sweeping net, as used by Mr. Crossley.

The ings, by the canal at Westfield Farm, Melbourne, gave the impression that they may be a rich locality for insects, even though mainly only very common species were taken by the writer. The abundance of the Nitidulid beetle *Kateretes bipustulatus* (Payk) was striking. Hundreds were taken in sweeping a twenty square yard area and many from the canal-side ditches in the water net. These ditches must carry a fairly heavy population of water beetles as very brief application of the water net under rather difficult conditions produced perhaps 50 individuals of the following nine species: *Agabus bipustulatus* (L), *Ilybius obscurus* Marsh., *I. fuliginosus* Fabr., *Hyphydrus ovatus* L., *Deronectes assimilis* Payk., *Hydroporus planus* Fabr., *Haliplus ruficollis* Deg., *Hydrobius fuscipes* L., *Helophorus aquaticus* L.

Other insects taken on the ings included the Ortalidid fly *Melieria crassipennis* (Fabr.) which was in greater numbers that I have seen it before. The few beetles taken were: *Cantharis fulvicollis* Fabr., *Coccidula rufa* (Hbst.), *Phaedon cochleariae* (Fabr.), *Gastroidea viridula* de G., *Hydrothassa marginella* (L), *Phyllobius pomaceus* Gyll. The only patch of *Epilobium hirsutum* L. examined yielded the plant bug *Dicyphus epilobii* Reuter.

Mr. Baldwin of Westfield Farm told us that clegs are a great nuisance during farming operations on the ings. On the lane from Eastfield House to the canal near Bielby, Ringlet butterflies were flying quite plentifully. Beating *Artemesia vulgaris* L. here yielded the Trypetid fly *Paroxyna parvula* (Loew. H.). The canal side at the lock by the above lane yielded: *Dromius linearis* Ol., *Agriotes pallidulus* (Ill.), *Malthodes marginatus* (Latr.), *Apion carduorum* Kirby., *Ceuthorrhynchus litura* (Fabr.), *Calocoris norvegicus* (Gmelm.) (common everywhere), *Notostira elongata* (Geoff.). The two weevils were beaten from *Cirsium arvense* (L) Scop.

Joyce Payne mentions the following Lepidoptera as being seen during the afternoon, in addition to the Ringlet, mentioned above: Red Admiral, Small Tortoiseshell, Meadow Brown, Green-veined White, Garden Tiger by canal at Westfield Farm, Drinker Barmby New Inn, Shaded Broad-bar — several seen on ings and in the above-mentioned lane. Several Mirids taken during the afternoon await identification.

Mr. Crossley's notes follow.

(R. Crossley): The ditches adjacent to the canal near Westfield Farm contained numerous corixid nymphs and also a nymph of a *Notonecta* species. Two adult lesser water boatmen were taken and these proved to be *Hesperocorixa sahlbergi* (Fieber) and *Sigara dorsalis* (Leach), both of which are common species. A fine water scorpion, *Nepa cinerea* L. was also seen.

The stretch of marsh vegetation dominated by grasses along the north side of the canal proved quite profitable in spite of the very poor collecting conditions. Here the fly with the banded wings, *Melieria crassipennis* was very common and three species of

Sciomyzidae were taken. These latter are predominantly marsh flies which in the larval stage parasitise or prey upon molluscs in a variety of ways. The species taken were *Knutsonia albiseta* Scop., *Pherbina coryleti* Scop., and *Tetanocera arrogans* Mg., the last being a local species and new to V.C. 61. A single specimen of the bee-like hover-fly *Volucella bombylans* L. was taken, this particular one being the 'red tailed' form known as *var. bombylans.*

The common soldier beetle *Rhagonycha fulva* Scop. was present on umbels and a single specimen of the rather local leaf beetle *Gastrophysa viridula* De Geer was taken. Numbers of the small but attractive beetle *Kateretes bipustulatus* Pk. were also present.

The true bugs (Hemiptera-Heteroptera) were represented by several common grassland species and the small black and green bug *Cyrtorhinus caricis* (Fall.) was especially numerous on the rushes.

Without doubt, however, the best capture of the day was a single male specimen of *Capsus wagneri* Remane. This bug was first recognized in Britain in 1954 when a single specimen was taken at Wicken Fen, Cambridgshire. Subsequently it was recorded from Askham Bog and these have remained the only two published British localities for this fenland species. The discovery of *C. wagneri* in this new locality is therefore of more than local interest and it is intended to publish a fuller note on this occurence at a future date.

My thanks are due to Mr. P. Skidmore for identifying the flies and to Mr. J. H. Flint for identifying the beetles and confirming my determination of *Capsus wagneri.*

Vascular Plants (E. Crackles): Various stretches of the Pocklington Canal were examined during the day. Species noted along a stretch of some hundred yards at the Canal Head included: *Plantago media* (Hoary Plantain) and *Galium verum* (Lady's Bedstraw). Large beds of *Carex acutiformis* were noted and other species seen in quantity were: *Epilobium hirsutum* (Great Hairy Willow-herb) and *Glyceria maxima. Lycopus europaeus* (Gipsywort) and *Phyllitis scolopendrium* (Hart's-tongue Fern) were noted on the lock walls, whilst *Erysimum cheiranthoides* (Treacle Mustard) was also found in this area.

The party proceeded to Westfield Farm. In the canal here *Lemna gibba* completely covered the water as far as the eye could see in both directions. *Ceratophyllum demersum* (Horn-wort), *Elodea canadensis* (Canadian Pondweed) and *Potamogeton crispus* (Curled Pondweed) were also present, and *Alisma plantago-aquatica* (Water-Plantain) occurred in a nearby drain. Fine specimens of *Galeopsis speciosa* (Large-flowered Hemp-nettle) attracted attention, whilst *G. tetrahit* (Common Hemp-nettle) and *G. bifida* both occurred nearby. A water meadow and marshy areas in this locality proved to be of outstanding interest. Beds of *Carex acuta* occurred in the water meadow, with *C. disticha* also frequent whilst other species noted included: *Myosoton aquaticum* (Water Chickweed), *Stellaria palustris* (Marsh Stitchwort), *Oenanthe fistulosa* (Water Dropwort), *Polygonum amphibium* (Amphibious Bistort), *Lysimachia nummularia* (Creeping Jenny), *Mentha aquatica* (Water Mint), *Senecio aquaticus* (Marsh Ragwort), *Juncus acutiflorus*, *Eleocharis palustris*, *Carex nigra* and *C. vesicaria* (Bladder Sedge). In an area inundated for an appreciable period each year, *Carex vesicaria* and *C. acuta* were remarkably abundant. Additional species present here were: *Thalictrum flavum* (Meadow Rue), *Filipendula ulmaria* (Meadow-sweet), *Lythrum salicaria* (Purple Loosestrife), *Hydrocotyle vulgaris* (Pennywort), *Lysimachia vulgaris* (Yellow Loosestrife), *Menyanthes trifoliata* (Bogbean), *Stachys palustris* (Marsh Woundwort), *Eupatorium cannabinum* (Hemp Agrimony), *Iris pseudacorus* (Iris) and *Sparganium erectum* (Bur-reed).

Apera spica-venti (Silky Bent Grass), locally frequent in parts of Lower Derwentland was reported from the vicinity of Walbut Lock and from Bielby. *Baldellia ranunculoides* (Lesser Water-Plantain) and *Triglochin palustris* (Marsh Arrow-grass) were reported from the vicinity of the lock. *Nuphar lutea* (Yellow Water-lily), *Rorippa sylvestris* (Creeping Yellow-cress) and *Arctium lappa* (Great Burdock), were noted near Hagg Bridge.

Some of the party visited the vicinity of Sandhill Lock. *Carduus acanthoides* x *C. nutans, Silaum silaus* (Pepper Saxifrage) and *Jasione montana* (Sheep's-bit) were recorded here.

Bryophytes (J. Robertson): Mosses occurred in only a few localities in the areas visited. The dry mortared walls of the old lock at Canal Head yielded: *Bryum argenteum*, *Ceratodon purpureus* var. *purpureus, Grimmia pulvinata, Camptothecium sericeum, Tortula muralis, T. ruralis, Hypnum cupressiforme,* and *Funaria hygrometrica.* Nearer the water, *Conocephalum conicum* covered large areas. On earth in nearby fields *Phascum cuspidatum* was common, and there was some *Barbula unguiculata* on the pathway.

In the water meadows near Westfield House grew large amounts of *Acrocladium cuspidatum, Drepanocladus aduncus* with some *Brachythecium rutabulum* and *Amblystegium serpens.*

CONCHOLOGY

(A. Norris): Records of Mollusca have been forwarded to me for three of the five Y.N.U. Excursions for 1968.

On the occasion of the Y.N.U. visit to Catterick, Miss F. A. Gunningham of Otley collected four species from the banks of the River Swale at Catterick and nine from the lake at Hornby Castle. Two species, the flat Ram's-Horn *Segmentina complanata* (L.) and the Lake Orb Mussel *Sphaerium lacustre* (Mull.) both taken from the lake at Hornby were new vice-county records for V.C. 65.

Thirty-five species were collected at the Mickley and Grewelthorpe meeting on the 8th of June. The most important record of the day was a small colony of the Plaited Snail *Acanthinula lamellata* (Jeff.) found in a small marsh at the Mickley end of Hackfall Woods (Grid Ref. 44/230766). This is only the third record of this species for Yorkshire in the past 20 years. Most of the other species found came from the old walls in the village of Grewelthorpe.

On the visit to Pocklington canal on the 20th July, 33 species were found, several of interest. The finding of a single living specimen of Lister's river snail *Viviparus contectus* Miller in the ditch at the ings near Melbourne, again confirmed this species as being a resident of East Yorkshire. *V. contectus* was recorded for East Yorkshire over two hundred and fifty years ago by Dr. Martin Lister, who first recorded it from its only known site at Wressle. The last record of a living specimen from Wressle was collected by William Nelson in 1886. Wressle is nine miles south of Melbourne.

The localities are as follows: (1) Banks of the River Swale, Catterick Bridge; (2) Hornby Castle; (3) Grewelthorpe; (4) Pocklington Canal.

Viviparus viviparus (L.), 4
V. contectus Millet, 4
Potamopyrgus jenkinsi (Smith), 3
Bythinia tentaculata (L.), 2, 4
B. leachi (Sheppard), 4
Carychium minimum Müller, 3
C.tridentatum (Risso), 3
Lymnaea palustris (Müller), 2, 3, 4
L. stagnalis (L.), 4
L. peregra (Müller), 2, 3, 4
Planorbarius corneus (L.), 4
Planorbis carinatus Müller, 4
P. planorbis (L.), 4
P. vortex (L.), 4
P. leucostoma Millet, 4
P. albus Müller, 2
P. crista (L.), 3
Segmentina complanata (L.), 2
Ancylus fluviatilis Müller, 2, 3
Succinea putris (L.), 4
S. pfeifferi Rossmässler, 4
Cochlicopa lubrica (Müller), 3
Columella edentula (Drap.), 3
Lauria cylindracea (da Costa), 3
Vallonia costata (Müller), 4
Acanthinula lamellata (Jeffreys), 3
Ena obscura (Müller), 3
Clausilia bidentata (Strom.), 3
Arianta arbustorum (L.), 1, 4
Helix hortensis (Müller), 1, 3
H. nemoralis L., 2, 4
H. aspersa Müller, 3
Hygromia striolata (C. Pfeiffer), 1, 3, 4
H. hispida (L.), 3, 4
Monacha granulata (Alder), 3
M. cantiana (Montagu), 4
Helicella virgata (da Costa), 4
Discus rotundatus (Müller), 3
Arion circumscriptus Johnston, 3
A. fasciatus (Nilsson), 3
A. hortensis Férussac, 3
A. subfuscus (Drap.), 3, 4
A. ater agg., 2, 3, 4
Euconulus fulvus (Müller), 3
Vitrea crystallina (Müller), 3
V. contracta (Westerlund), 3
Oxychilus cellarius Müller, 3
O. alliarius (Miller), 3, 4
Retinella pura (Alder), 3
R. nitidula (Drap.), 3, 4
Zonitoides nitidus (Müller), 3, 4
Limax maximus L., 4
Lehmannia marginatus Müller, 3
Agreolimax reticulatus Müller, 3, 4
A. laevis (Müller), 3
Unio pictorum (L.), 4

U. tumidus Philipsson, 4
Anodonta cygnaea (L.), 4
A. anatina (L.), 1, 4
Sphaerium corneum (L.), 2, 4
S. lacustre (Müller), 2, 3

Nomenclature is according to the *Census of the Distribution of British Non-Marine Mollusca* (1951).

FIELD NOTES

Little Bunting at New Marske Reservoir — Second County Record

On the afternoon of 11th November, 1967, T. Bradbury and D. Wood found a Little Bunting (*Emberiza pusilla*) in the hedge of the lane leading to New Marske Reservoir. The bird was watched over a period of 45 minutes as it fed on the ground, or perched on the hedge and as it flew. A fully detailed description was taken by the observers and the record has been accepted by the County Recorders from these details.

The call note, a robin-like 'tic', was heard while the bird was perched and in flight, and is a diagnostic confirmation to the plumage details which included the chestnut cheeks, pale fawn upstripe and black moustacial marks. The bird was seen to be noticeably small though no Reed Buntings (*Emberiza schoeniclus*) were about to aid in a direct comparison.

The first Little Bunting recorded in the County was a male caught at Whitby, withmall or sb therids on 6th October, 1913 and identified by W. Eagle-Clarke (*Naturalist*, 1913, p.421).

A. J. Wallis

Starlings Waterlogged by Heavy Rain

On the morning of 11th July, 1968 at least a hundred Starlings (*Sturnus vulgaris*) were found close to the Hull Corporation Pier, under a few trees used by Starlings as a summer and autumn roost. All were in a very wet and bedraggled condition following heavy overnight rain, some were already dead, others were taken to the local R.S.P.C.A. and after drying out were able to fly off. According to passers by in the vicinity, the birds had attempted to fly from the trees but had immediately dropped to the ground, and in a few cases, had been seen to drop into the Humber. Eight of the dead birds came into my possession, and were sent to Mr. J. R. Mather who classified them as three Juveniles: two first year males: two first year females: and one adult male. The latter had an elongated bill, with a very pronounced downward curve, the length being 44 mm.

Brian S. Pashby

FROGS — INFORMATION REQUIRED

I am continuing a long-term study concerning the Common Frog and wonder whether any of your readers may have information re the following:

1. Are tadpoles still as plentiful in your district as, say, three years ago?
2. Did you see any spawn which failed to hatch?
3. Did any spawn which did hatch produce noticeably fewer tadpoles than one would have expected?
4. Have any tadpoles been seen with a distinct kink at the base of the tail?
5. Have any tadpoles been seen which gyrated during swimming?
6. Records of tadpoles over-wintering as tadpoles

I should be most grateful for any information along these lines; such should include the exact locality and height if known, the approximate date and observer.

Ellen Hazelwood
44 Rigby Lane, Bradshaw, Bolton, Lancs.

BRYOLOGICAL MEETING AT KIRKHAM ABBEY, V.C. 61, 20th APRIL, 1968

F. E. BRANSON

This meeting was a very productive and enjoyable one. It was a fine sunny day, but thanks to previous rains the bryophytes were moist and not in that dried-up state which makes them virtually unidentifiable in the field. This proved to be one of the best meetings we have known in the East Riding. Eight new vice-county records were made and several others would probably have been so if the specimens collected had been more complete.

The party worked the area bordering the river Derwent to the north of Kirkham Abbey, as far as Firby Wood. At first the route traversed open marshy country surrounded by meadowland. A drainage ditch recently cut through this area proved to be rich in mosses. The broad clayey track then followed, ran parallel to and a few yards from the bank of the river on the one side, with the wooded valley side rising fairly steeply and almost immediately on the other. This track, which was locally marshy and bordered intermittently by shallow runnels and patches of marshy ground, together with the lower stretches of rocky slope bearing a mixture of deciduous trees, was intensively worked for bryophytes. Some members of the party proceeded to Firby Wood where the trees are entirely coniferous. Broadly speaking, the valley is Upper Lias (calcareous clay and limestone) with the Dogger (a type of sandstone) forming the terrace above. One suspects that the picture is by no means as simple as this; some of the boulders on the lower slopes are of sandstone. The species of flowering plants and mosses present, however, indicate that calcareous soils prevail and much of the soil must be rich in humus.

The new vice-county records were as follows (with name of the finder). They have all been accepted by the British Bryological Society as records for V.C. 61.

HEPATICAE:

Ptilidium pulcherrimum, Kirkham Abbey Wood (M. Dalby)
Plagiochila asplenioides var. *major*, Kirkham Abbey Wood (M. D. and M. R. D. Seaward)

MUSCI:

Fissidens minutulus var. *minutulus*, Kirkham Abbey Wood (F. E. Crackles)
Trichostomum sinuosum, field near Kirkham Abbey (F. E. Branson)
Grimmia trichophylla, wall by Kirkham Abbey (M.D.)
Isopterygium depressum, Kirkham Abbey Wood, several places (F.E.B.)
Plagiothecium denticulatum c.fr., Kirkham Abbey Wood (F.E.B., M.D.)
P. succulentum, Kirkham Abbey Wood (M.D.)

The chief ecological areas investigated were some water-logged areas, the drainage ditch, an area with rushes (Juncetum), a calcareous stream running into the river with marshy areas on its banks and also a considerable amount of tufa formation, woodland, and miscellaneous places. I will now take each of these areas in turn and give an account of the species which we found there.

(*a*) *Water-logged areas with fallen tree trunks, etc.*

Leptodictyum riparium c.fr., *Leskea polycarpa*, *Dicranoweissia cirrata* (on willow), *Aulacomnium androgynum*.

(*b*) *Drainage ditch:*

One of the most conspicuous mosses here was *Physcomitrium pyriforme* with abundant capsules. There were also patches of *Dicranella schreberana*, and I had a nice specimen of *Weissia microstoma* with abundant capsules. Other species:

Polytrichum juniperinum
P. commune
P. piliferum
Tortula muralis (on stones)
Bryum caespiticium c.fr.
B. pallens
B. pseudotriquetrum c.fr.

Funaria hygrometrica c.fr.
Philonotis fontana
Drepanocladus aduncus
Acrocladium cuspidatum c.fr.

Marchantia polymorpha

(*c*) *Juncetum:*

Acrocladium cuspidatum (in wet pockets), the drier hummocks dominated by *Pohlia nutans*; *Bryum pseudotriquetrum*, *B. caespiticium*, *Funaria hygrometrica*, *Physcomitrium pyriforme*, and *Phascum cuspidatum*.

(*d*) *Calcareous stream:*

Here, the tufa formation was considerable, supporting a prolific covering of *Cratoneuron commutatum* var. *commutatum*. There were also dense patches of *Mnium seligeri* and *Brachythecium rivulare*. Also *Bryum pseudotriquetrum*, *Mnium undulatum*, *Cratoneuron filicinum*, and the hepatics *Conocephalum conicum*, *Pellia endiviifolia*, *Riccardia sinuata*, and *Cephalozia bicuspidata* (on a fallen branch).

(*e*) *Woodland:*

By far the greater number of species were found in the steeply rising wood on the side of the valley.

Atrichum undulatum (of 175 perichaetia bearing capsules examined, 17 had two setae and one had three setae; ratio (%) of mono-, di-, and tri-setous perichaetia = 89.7 : 9.7 : 0.6 (cf. Longton, 1962; Seaward, 1964).

Other species: (*Hepaticae*)

Metzgeria furcata
Lepidozia reptans
Plagiochila asplenioides var. *asplenioides*
Lophocolea bidentata
L. cuspidata
L. heterophylla
Porella platyphylla

Musci

Polytrichum juniperinum
Fissidens taxifolius
F. bryoides c.fr.
Dicranella heteromalla c.fr.
Dicranoweissia cirrata
Encalypta streptocarpa
Barbula recurvirostra c.fr.
Grimmia apocarpa c.fr.
Mnium stellare
M. undulatum
M. punctatum
M. longirostrum
M. hornum
Orthodontium lineare c.fr.
Aulacomnium androgynum
Neckera complanata
Omalia trichomanoides
Anomodon viticulosus
Thuidium tamariscinum
Cratoneuron filicinum
Campylium stellatum
Amblystegium serpens
Isothecium myurum
I. myosuroides
Brachythecium rutabulum
B. velutinum
Cirriphyllum piliferum
C. crassinervium
Eurhynchium praelongum
E. striatum
E. swartzii
Plagiothecium sylvaticum c.fr.
Ctenidium molluscum

(*f*) *Waste places, arable land, walls, etc., around Kirkham:*

Ceratodon purpureus var. *purpureus*
Phascum cuspidatum
Tortula muralis
Barbula fallax
B. unguiculata
Grimmia pulvinata
Funaria hygrometrica
Bryum argenteum
B. capillare
B. rubens
B. bicolor
Camptothecium sericeum
Rhytidiadelphus squarrosus

I collected a form of *Ceratodon purpureus* var. *purpureus* from a roadside fence, resembling *Barbula lurida* in appearance macroscopically. This resemblance, of course, vanishes when examined microscopically. It is a very common form and occurs abundantly around Birkham Wood, Knaresborough.

Note on the flowering plants (F. E. Crackles):

It was good to have confirmation of two very old records for the Kirkham area. Toothwort (*Lathraea squamaria*) 'in the woods near Kirkham' seems to have been unconfirmed since Teesdale's time, and Moschatel (*Adoxa moschatellina*), seen in two parts of Kirkham Abbey Woods has not been recorded for the East Yorkshire side of the Derwent this century. Two plants of Herb Paris (*Paris quadrifolia*) were also seen and this species had not previously been recorded for Kirkham.

I am grateful to Miss F. E. Crackles for contributing the second paragraph on the conformation of the area visited and the note on the flowering plants, and to Mr. M. R. D. Seaward for sending me some ecological notes. Also to Mr. A. Crundwell, Mrs. J. A. Paton, Mr. E. R. B. Little and Mrs. J. W. Fitzgerald. Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg for the mosses, and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton for the hepatics.

F. A. LEES' BOTANICAL COLLECTIONS: PART 2

MARK R. D. SEAWARD

This is the second in a series of papers dealing with the herbaria of F. A. Lees (1847–1921). This, like the previous paper (Seaward, 1967), deals solely with his Lincolnshire work; future papers will be devoted to his Yorkshire collections.

The Lees herbarium was purchased by the Bradford Corporation in 1905 and is housed in the Cartwright Hall, Bradford. Unhappily since that date few research workers have utilised this collection. The contents of flowering-plants, ferns, bryophytes and lichens, provide the nucleus and foundation of Yorkshire and Lincolnshire flora studies (see Lees, 1910); several other counties are also represented. There are approximately 25,000 specimens. Lees' library, comprising about 535 books and leaflets, is housed in the Bradford City Library (for comprehensive details see the special catalogue prepared, 1909), and forms a valuable accompaniment to the herbarium.

Through the courtesy of the Director of the Cartwright Hall I have been able to study the Lincolnshire material during the past few months. The bryophyte and lichen packets in question are annotated in Lees' neat handwriting, and although most are fully labelled, the data on many packets are inadequate and only to one briefed with his Lincolnshire activities would the abbreviations and limited locality information become intelligible.

The moss material (together with that housed at the City and County Museum, Lincoln; Seaward, 1967) constitutes a comprehensive reference collection which substantiates the records published in the Lincolnshire *Outline Flora* (Lees, 1892). Only a brief mention was made to the Cartwright Hall collection in my previous paper, and only two species, *Campylium stellatum* and *Eurhynchium striatum*, were cited. The extent of the Lincolnshire material at that time was not fully appreciated, only a minor search having been made on behalf of the author.

The majority of the bryophyte material is correctly determined although the nomenclature is naturally out of line with modern usage. Once again, the search for hepatic and lichen material to substantiate Lees' *Outline Flora* records has met with only limited success.

The nomenclature and reference numbers of the mosses and hepatics in the check-list which follows are those of Warburg (1963) and Paton (1965) respectively; lichen nomenclature follows James (1965). In each instance the locality (all in North Lincolnshire: V.C. 54) and date of collection are indicated. Fruiting material when present is indicated by *c.fr.*; it is particularly interesting to note the sporophyte-producing capacity of many of the mosses, in some instances a rare feature in lowland habitats. In many cases a reference to a published source is given, and the following abbreviations are used in this connection:

B.L.R.C.Rep.	*The Botanical Locality Record Club Report.*
L.N.U.Trans.	*Lincolnshire Naturalists' Union Transactions.*
Nat.	*The Naturalist.*
Out.Fl.	*Outline Flora of Lincolnshire.*

I should like to express my thanks to Miss M. Hartley for her assistance in the examination of the packets and to Mrs. J. Appleyard, Miss E. M. Lobley, Mrs. J. A. Paton, Mr. R. D. Fitzgerald and Mr. E. C. Wallace, for their determination or confirmation of some of the bryophyte specimens.

SPHAGNA (11 packets)

1/1 *Sphagnum palustre* L., Linwood, 1878 and Rasen, 1878.

1/3 *S. papillosum* Lindb., Linwood, 1877.

1/5 *S. compactum* DC., Linwood, Dec. 1877 and 1878.

1/16 *S. cuspidatum* Ehrh., Linwood, 1879.

1/18 *S. subsecundum* Nees, var *subsecundum*, Rasen, May 1878; var. *inundatum* (Russ.) C. Jens., Linwood, Nov. 1877; var. *auriculatum* (Schimp.) Lindb., Rasen, May 1878.

1/19 *S. fimbriatum* Wils., Linwood, 1878.

1/25 *S. capillaceum* (Weiss) Schrank, Linwood, Nov. 1877, *c.fr.*

TRUE MOSSES (90 packets)

5/3 *Polytrichum urnigerum* Hedw., Rasen, 1878, *c.fr.*

5/6 *P. piliferum* Hedw., Linwood, Jan. 1878, *c.fr.*; Rasen, 1879, *c.fr*

5/7 *P. juniperinum* Hedw., Linwood, 1878, *c.fr.*

8/15 *Fissidens taxifolius* Hedw., Rasen, May 1877, *c.fr*.

8/17 *F. adianthoides* Hedw., Rasen, 1877, *c.fr*.

29/12 *Dicranum bonjeanii* De Not., Rasen, Oct. 1877 and 1879.

31/4 *Campylopus fragilis* (Brid.) B., S. & G., Rasen, 1877, *c.fr*.

31/6 *C. flexuosus* (Hedw.) Brid., Rasen, 1877.

35/4 *Tortula intermedia* (Brid.) Berk., Claxby, May 1878.

35/10 *T. subulata* Hedw., Rasen, Dec. 1877, *c.fr*.

40/5 *Pottia truncata* (Hedw.) Fürnr., Rasen, 1878, *c.fr*.

41/2 *Phascum cuspidatum* Hedw., Rasen, Apr. 1879.

44/7 *Barbula fallax* Hedw. (with 22/4 *Dicranella varia* (Hedw.) Schimp.), Rasen, Apr. 1879.

44/20 *B. recurvirostra* (Hedw.) Dix., Tealby, 1879, *c.fr*.

55/2 *Grimmia apocarpa* Hedw., Claxby, May 1878, *c.fr*.

55/20 *G. pulvinata* (Hedw.) Sm., Claxby, 1878, *c.fr*.

77/19 *Bryum pseudotriquetrum* (Hedw.) Schwaegr., Rasen, 1878 and Apr. 1879, *c.fr*.

77/37 *B. capillare* Hedw., Claxby, 1878.

79/9 *Mnium longirostrum* Brid., Rasen, 1878.

81/1 *Aulacomnium palustre* (Hedw.) Schwaegr., Linwood, 1878 and 1879.

87/2 *Bartramia pomiformis* Hedw., Rasen, 1878, *c.fr*. and 1879, *c.fr*.

91/1 *Breutelia chrysocoma* (Hedw.) Lindb., Linwood, 1879 — see: *Nat.*, 1967, 78.

98/2 *Orthotrichum anomalum* Hedw., Claxby, May 1878, *c.fr*.

98/5 *O. affine* Brid., Stainton-le-Vale, March 1878; Rasen, 1878, *c.fr*. and 1879, *c.fr*.

99/3 *Ulota crispa* (Hedw.) Brid., Rasen, Jan. 1878, *c.fr*.; Legsby, Oct. 1879, *c.fr*.

101/1 *Climacium dendroides* (Hedw.) Web. & Mohr, Rasen, 1878, *c.fr*. and 1879.

104/1 *Leucodon sciuroides* (Hedw.) Schwaegr., Claxby, Apr. 1878, *c.fr*.

109/4 *Neckera complanata* (Hedw.) Hüben., Claxby, 1878; Rasen, Apr. 1878.

110/1 *Omalia trichomanoides* (Hedw.) B., S. & G., Claxby, May 1878, *c.fr*.

111/1 *Thamnium alopecurum* (Hedw.) B., S. & G., Linwood, May 1877; Wickenby Holt, Nov. 1879, *c.fr*.

125/1 *Cratoneuron filicinum* (Hedw.) Spruce, Rasen, Apr. 1878.

126/1 *Campylium stellatum* (Hedw.) J. Lange and C. Jens., Barnetby Junction, Aug. 1878; Fossdyke, near Lincoln, Aug. 1878 — see: *Nat.*, 1967, 78.

126/3 *C. chrysophyllum* (Brid.) J. Lange, Tealby, 1879.

127/1 *Leptodictyum riparium* (Hedw.) Warnst., Rasen, Dec. 1877, *c.fr*.

129/1 *Amblystegium serpens* (Hedw.) B., S. & G., Claxby, 1878, *c.fr*.

131/1 *Drepanocladus aduncus* (Hedw.) Warnst. (var. *kneiffii*), Rasen, May 1879 — see: *B.L.R.C.Rep.*, 1878, 41; *Nat.*, 1964, 108.

131/4 *D. fluitans* (Hedw.) Warnst., Barnetby, 1878.

133/1 *Scorpidium scorpioides* (Hedw.) Limpr., Wrawby Moor, 1877.

134/6 *Acrocladium cuspidatum* (Hedw.) Lindb., Rasen, May 1877 and Apr. 1879, *c.fr*.

135/2 *Isothecium myosuroides* Brid., Stainton-le-Vale, March 1878.

137/2 *Camptothecium lutescens* (Hedw.) B., S. & G., Claxby, Apr. 1878, *c.fr*.

138/2 *Brachythecium glareosum* (Spruce) B., S. & G., Rasen, 1878 — see: *B.L.R.C.Rep.*, 1878, 40.

138/4 *B. salebrosum* (Web. & Mohr) B., S. & G., Rasen, Dec. 1877, *c.fr*. and Nov. 1878, *c.fr*. — see: *B.L.R.C.Rep.*, 1878, 40; *Nat.*, 1967, 79.

138/5 *B. mildeanum* (Schimp.) Milde, Rasen, 1879, *c.fr*.

138/6 *B. rutabulum* (Hedw.) B., S. & G., Rasen, Dec. 1877, *c.fr*.

138/11 *B. velutinum* (Hedw.) B., S. & G., Legsby, 1878, *c.fr*.

138/12 *B. populeum* (Hedw.) B., S. & G., Claxby, 1878, *c.fr*.

138/13 *B. plumosum* (Hedw.) B., S. & G., Rasen, 1877, *c.fr*.

141/1 *Eurhynchium striatum* (Hedw.) Schimp., Rasen, Jan. 1877, *c.fr*.; Legsby (c. 1878) — *E. striatulum* according to *B.L.R.C.Rep.*, 1878, 41; *E. striatum* var. *arcuatum* according to *B.L.R.C.Rep.*, 1879-80, 92 and *Out.Fl.*, 1892, 60; see also: *Nat.*, 1967, 79.

141/4 *E. praelongum* (Hedw.) Hobk., Legsby, 1878; Rasen, 1878, *c.fr*.

141/11	*E. confertum* (Dicks.) Milde, Rasen, 1877, *c.fr.*
142/4	*Rhynchostegiella tenella* (Dicks.) Limpr., Rasen, 1878, *c.fr.*
146/1	*Pseudoscleropodium purum* (Hedw.) Fleisch., Rasen, May 1877; Osgodby, March 1879, *c.fr.*
147/1	*Pleurozium schreberi* (Brid.) Mitt., Rasen, 1877, *c.fr.*
149/4	*Plagiothecium denticulatum* (Hedw.) B., S. & G., Rasen, Dec. 1877, *c.fr.*
149/12	*P. undulatum* (Hedw.) B., S. & G., Rasen, 1877, *c.fr.*
154/1	*Hypnum cupressiforme* Hedw., var. *cupressiforme*, Rasen, Dec. 1877, *c.fr.* and Linwood, May 1878; var. *resupinatum* (Wils.) Schimp., Rasen, Dec. 1877; Legsby, 1878; Claxby, May 1878; var. *ericetorum* B., S. & G., Rasen, May 1877.
156/1	*Ctenidium molluscum* (Hedw.) Mitt., Claxby, Apr. 1878.
160/2	*Rhytidiadelphus squarrosus* (Hedw.) Warnst., Linwood, 1878, *c.fr.*
160/3	*R. loreus* (Hedw.) Warnst., Rasen, May 1877, *c.fr.* — see: *B.L.R.C.Rep.*, 1878, 41.
161/4	*Hylocomium splendens* (Hedw.) B., S. & G., Rasen, 1878, *c.fr.*

HEPATICS (6 packets)

10/8	*Riccia sorocarpa* Bisch. (incorrectly labelled *R. glauca* var. *minor*; as *R. glauca* in *Out.Fl.*, 1892, 60), Rasen, Apr. 1879.
27/1	*Ptilidium ciliare* (L.) Hampe, Linwood, May 1879.
29/1	*Blepharostoma trichophyllum* (L.) Dum., Linwood, 1879.
46/8	*Solenostoma crenulatum* (Sm.) Mitt., Linwood, 1879, *c.fr.*
66/1	*Odontoschisma sphagni* (Dicks.) Dum., Linwood, 1879.
82/5	*Frullania dilatata* (L.) Dum., Stainton-le-Vale, March 1878.

LICHENS (4 packets)

Cetraria islandica (L.) Ach., Firwood on Walesby Road, 1 mile out of Market Rasen, 1879 — see: *Nat.*, 1878, 97–102; *Nat.*, 1967, 77.

Cladonia arbuscula (Wallr.) Rabenh. (incorrectly labelled *C. rangiferina* (L.) Web. — a species unrecorded from lowland Britain, see: *L.N.U.Trans.*, **16**, 155 (1965)), Linwood Warren, 1877 — see: *Nat.*, 1887, 296.

C. impexa Harm. (incorrectly labelled *C. rangiferina* (L.) Web. — see also previous taxon), Linwood Warren, 1878 — cf. *Out.Fl.*, 1892, 60.

C. tenuis (Flörke) Harm. (incorrectly labelled *C. rangiferina* (L.) Web.), Linwood Warren, 1878.

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BOOK REVIEWS

Freshwater Fishes of Eastern Canada by **W. B. Scott.** 2nd edition. Pp. 137 with 104 black and white photographs and a map. University of Toronto Press. London: Oxford University Press. 1967. 21/6.

This paperback covers more than 150 species of fishes and is a model of compact publication. Most of the species are illustrated with good quality black and white photographs, which are much more useful than inferior colour plates. A surprising number of genera and species will be familar to the British naturalist or angler and thus the book will be usable in this country. Apart from scientific and folk names, distinguishing features, size, occurrence, life history and habits are neatly summarised. From the humble Sticklebacks, Darters and Minnows to the mighty Muskellunge; all are given the same authoritative, concise but very readable treatment. If only someone would do the same for the European freshwater fish fauna! T.M.C.

Wild Animals of the British Isles by **Maurice Burton.** Pp. 215 with 32 colour and 54 black and white photographs and numerous line drawings. Frederick Warne and Co. Ltd. 1968. 40/-.

This is the latest volume in Warne's celebrated *Wayside and Woodland* series and is, in many ways, the successor to Edward Step's *Animal Life of the British Isles.* The publishers deserve praise for their fine series of books which have served generations of naturalists and also for having such first rate authors to write for them. This is a very welcome addition to the range.

I like the inclusion of mammals, reptiles and amphibians in the same volume — but regret the author's decision not to include the cetaceans. I go out on my excursions of late with far more chance of seeing a whale than I have of meeting the less common carnivores. However, this is a petty quibble, and this is a very good book.

It is not a field guide, not yet a handbook, but a summary of the present state of our knowledge of the species concerned, up-to-date and readable, but none the less accurate. The increase in studies on the Cinderella groups of vertebrates made this book necessary and it would be a tribute to Dr. Burton if his stimulating work were to need constant revision from now on. The Surrey 'Puma', the Jugoslavian mouse plague of 1967 and a number of topical subjects of this type are covered by this work and, for the first time to my knowledge, the feral cat and dog are treated as full members of the British fauna. The gallery of photographs, apart from a distressingly blue polecat, are a feature of the book — with the largest contribution being made by Jane Burton. If your book shelf still holds a copy of Step's work, now is your chance to bring it up-to-date, and if it does not, here is a book you will enjoy. T.M.C.

Watching Wild Life by **Richard Philps.** Pp. 128 with 100 black and white photographs and 18 text figures. Brockhampton Press. 1968. 21/-.

Dr. Richard Philps, who makes wild life films including some Council for Nature prize-winners, attempts in this book to put over some of the background against which he works. Apart from a few bird portraits taken as stills, the illustrations in the book are enlarged frames from cine sequences. Neither are entirely successful, but the informal sequences of cine shots do at least make one want to see them in full colour and movement.

The background information on fieldcraft, hide work and so on includes some useful hints, but the section on wait-and-see photography has a rather dated feel. My mind went back to the classic articles by Emily Turner in the early issues of *British Birds.*

The main actors in the photographic section are Water Voles and Mink, Foxes, Kingfishers, Honey Bees and Wood Ants. All of them suffer in the translation from cine to still, but even so some of the clipped sequences convey certain behaviour aspects better than a formal still picture. The author points out that animal behaviour was the reason for their inclusion — but then states that this is unashamedly a picture book. In my opinion, it falls heavily between two stools. T.M.C.

Principles of Animal Physiology by **Dennis W. Wood.** Pp. x + 332 with 119 text figures. Edward Arnold Ltd. 1968. 72/-.

This is a very readable text-book which, on the whole, fulfils the claim of its author to serve as an introduction to physiology for students. Although it is a welcome change to see more space and attention devoted to topics which come under the broad heading of neurophysiology (139 pages) some readers may feel that rather more than two fifths of the book devoted to this subject destroys its balance. Certainly such subjects as respiration and metabolism (Ch. 4), excretion (Ch. 5) and temperature relationships (Ch. 8) appear at first sight to have received rather cursory treatment, as they are dealt with in a total of only 40 pages. However, this illusion is dispelled on reading the book. Although some of these other topics are not dealt with in the same depth as neurophysiology they are treated clearly and concisely and provide a sound basis for more detailed reading. The final chapter on homeostasis provides a useful summary to the book. Apart from a few inevitable minor errors the book is well written and attractively published. The figures have been carefully selected and are generally clear and well-annotated. *Principles of Animal Physiology* can certainly be recommended for use by first year undergraduates and will also provide useful additional reading for S-level students. P.J.M.

Animal Societies: from the Bee to the Gorilla by **Remy Chauvin,** translated by George Ordish. Pp. 285, with 32 plates and 60 text-figures. Gollancz. 1968. 45/-.

This is the English translation of the book originally published in French in 1963. Professor Chauvin, who is Head of the Psycho-physiology and Behavioural Science Department at Strasbourg University, surveys the wide field of social relationships in the animal kingdom by comparing the organisations of the very impressive insect societies of bees, wasps, ants and termites with those of the birds and mammals. Many others have written on this theme already but Professor Chauvin brings to it a lively enquiring mind and a most attractive freshness of approach, and the informal and — on occasion — anecdotal style of writing immediately compels the attention of the general reader and maintains his interest.

The insect societies are the subject of the first half of the book, most detailed attention being given to the honey bee with a shorter chapter on the ants and only fourteen pages on the wasps and termites. The section on the honey bee is an admirable and up-to-date account of their social activities with a lucid account of the work by von Frisch and others on the language of the bees and on its variation in local races of bee; and this is followed by accounts of many investigations carried out in the Strasbourg laboratory by Chauvin and his co-workers as for instance on the antibiotic substances present in the hive and on problems of cohesion and defence of the colony and these latter aspects are the ones chosen for most detailed treatment in the accounts of the ants and termites.

A chapter on migration, illustrated by locusts and lemmings, is sandwiched somewhat incongruously between the account of the insect societies and the second half of the book which is devoted almost entirely to the vertebrates, largely to the birds and mammals. A chapter on the elements of social life, viz. territory, recognition and social hierarchy, is followed by one on means of communication and separate chapters then deal with the birds, the primates and the other mammals. The unity of treatment and co-ordination of material, achieved so well in the first half of the book, is less evident here and there is some repetition particularly on the subject of social hierarchies. Nevertheless, the author's enthusiasm for his subject makes this section no less fascinating than the first and the book as a whole brings out very clearly the distinctive features of insect, bird and mammalian societies.

The translation into English by George Ordish is excellent. Very few mistakes were noted. The 'sandpipers' referred to on pp. 204 and 207 are clearly ruffs, and the notes on the plates at the end of the book would have been more helpful had the plates been numbered.

E.B.

The Pocket Encyclopaedia of Plant Galls in Colour by **Arnold Darlington,** with illustrations by M. J. D. Hirons. Blandford Press. 25/-.

There will be an especial welcome for this book since nothing comparable is available at present. The works of Connold (1909) and Swanton (1912) have long been out-of-date and out of print and a new introduction to the plant galls has been much needed. This book consists of 80 coloured plates followed by 71 pages of explanatory text, with a brief introduction describing the nature of galls and how to study them. Identification is achieved by comparing specimens with the plates and reference is then made to the brief notes in the text. The illustrations, coloured and black and white are, with a few exceptions, good; the text is concise and to the point.

The selection of galls includes the common ones, the bean galls on the willows, the many different galls on the oak, and also a varied selection of less familiar galls, mite galls on scabious, moth galls on plantain, beetle galls on harebell, fly galls on common reed, fungus galls on poplar and so on. It is, however, an introduction and the necessary condensation may be responsible for some misleading statements. The rose galls caused by *Diplolepis eglanteriae* and *D. nervosus*, for example, are not reliably separable since the gall of *D. nervosus* is not invariably spiked. Benson's studies of the bean gall sawflies of the genus *Pontania* appear to have been neglected since *Pontania viminalis* and *P. pedunculi* are treated here as synonyms while *Salix triandra* is said to be galled by *P. proxima* instead of its specific sawfly *P. triandrae*. But these are minor defects which will become apparent only to the more advanced student who must use the specialised literature. This little book should open up a new field to many naturalists.

J.H.F.

Field and Meadow Life by **Leif Lyneborg,** edited for the English edition by Arnold Darlington, colour plates by Henning Anthon. Blandford Press. 21/-.

This little reference book complements previous volumes in the series, and consists of 80 coloured plates containing over 600 figures followed by 75 pages of notes on the species figured. The selection of species is Danish and there is a little overlapping of previous volumes, but once again the bulk of what is included is likely to be seen in our own countryside. There is a very wide range of material, woodlice, millipedes, snails, spiders, etc., but the greater part figures insects and plant galls. It is a very attractive book for the young naturalist.

The figures are very good indeed and only two can be criticised; *Carabus nemoralis* and *C. granulatus* are not recognisable as such. The text, unhappily, is not so free from error. An obvious blunder, which undermines confidence, is the name 'Small Copper, *Lycaena phlaeas*' applied to figures of a continental butterfly which rather resembles our Large Copper, a very different species. The queen bumblebee figured, *Bombus terrestris*, has a white tail as on the continent. Our British bee has a buff tail, hence its name, but this distinction is not mentioned and it is described as the 'Buff-tailed Bumble-bee . . . recognised by its silver-grey abdominal tip'. The notes on distribution are sometimes inaccurate or misleading. The beetle *Carabus granulatus* is not 'very common over the whole country'; *Carabus convexus* is not British as implied here; *Broscus cephalotes* is not 'very common on open, more or less dry and sandy soil' in this country. These are three consecutive notes in the book. Errors of this sort appear to derive from a misreading of the standard works, an example of this probably being the statement that the bug *Dolycoris baccarum* is 'one of our commonest and most widely distributed shieldbugs' (which it is not) which is recognisably taken from Southwood and Leston, *Land and water bugs of the British Isles*, although this is not what those authors wrote. The reviewer is puzzled by the inclusion of the larvæ of the Cinnabar and Goat moths with 'spinning larvæ'; the text does not explain this. Is it an error in translation? There are some spelling mistakes in the scientific names.

Ordinarily a popular little book like this would not warrant so long a notice, but the series of which it forms part is so attractive, is so much what the beginning naturalist needs, that it is regrettable that wrong and misleading statements will lead to undermining of confidence. More care should be taken to ensure accuracy and to distinguish those species which do not occur here from those which do. J.H.F.

The Oxford Book of Insects. Text by **John Burton** with **I. H. H. Yarrow, A. A. Allen, L. Parmenter** and **I. Lansbury.** Illustrations by **Joyce Bee, Derek Whiteley** and **Peter Parks.** Pp. 208 (including 96 colour). Oxford University Press. 50/-.

This follows the usual pattern of the series, colour plates with facing pages of explanatory text on species figured. The selection of species, nearly 800, has been well made and ranges from the obvious butterflies and moths to the undistinguished flies such as the abominable *Hydrotaea* which assembles in clouds around the heads of perspiring walkers in the woods on hot days. The text is concise, relevant and accurate. A distinguished panel of entomologists has given assistance and errors are very few. On plate 27 the numbers 2 and 3, 5 and 6 have been transposed and thus indicate the wrong names for the species depicted and on plate 29 segments 3 and 4 of the antennae have been omitted in figure 5.

But a book of this sort depends for its success largely on the quality of its illustrations and these are not uniformly satisfactory. Throughout the book the colour tones are rather muted and the outlines softened and there is a consequent loss of clarity. The butterflies and moths and their accompanying caterpillars are generally well drawn. The grasshoppers, bees, wasps, ants, beetles and some of the minor orders are shown magnified to a suitable size wherever necessary and these also are well executed although in some the background of leaf or bark obscures the outline of the insect and this is a mistake. In contrast, the small jassid leaf-hoppers and many of the flies are shown life size and are too often quite unrecognisable.

It is a great pity that more care could not have been taken with the illustrations. Surely someone could have told the artist that bumblebees do not have broad bands of green hairs or cuckoo-bees bands of blue-grey hairs, that the violet ground beetle, *Carabus violaceus* does not have a marked green sheen on its back, and so on. There are too many such failures and as a result it is not possible to accord the book the warm welcome that one would wish. J.H.F.

Biological Principles in Fermentation by **J. G. Carr.** Pp. 88 with 4 plates and 26 text figures. Heinemann. 18/-.

This book is one of the 'Scholarship Series in Biology' and is designed primarily for readers in the sixth-forms and first-year undergraduates, but it may also be of interest to those concerned with fermentation such as amateur wine-makers.

At first glance the book appears to be good; it has introductory chapters on the relevant biology followed by chapters on the manufacture of fermented liquors. Detailed examination does not confirm the initial impression, particularly with reference to the presentation and content of the general biology section. The introductory chapters describe the yeasts and bacteria associated with fermented beverages; microbial nutrition, composition and synthesis; and metabolic pathways in fermentation with special reference to energy gain. Many facts are presented in rather dull and catalogue form. There are areas of confusion, e.g. p. 13 — 'various hydrolytic enzymes, probably those of the Emden-Meyerhof-Parnas pathway (see Chap 4), and in particular invertase'. The enzymes involved in the pathway are not hydrolytic, and invertase is not usually considered a component of the E.M.P. pathway. Further confusion arises when Chapter 4 is referred to since here it stated more correctly that alcoholic fermentation (and hence the E.M.P. pathway) involves a series of dehydrogenations.

The section on basic biology seems to be divorced from the following chapters concerned with brewing, wine and cider making. The descriptions of these industrial processes and the disorders which occur in fermented liquors are interesting, informative and well illustrated. But the avowed object of the book is — 'to explain fundamental biological principles through their application' — and this it is doubtful if the author has achieved. E.H.

Practical Work in Biology. Edited by **G. R. Meyer** with **N. W. Buckingham, E. D. Clarke** and **M. I. Shiels.** Illustrated by **E. R. Sakker.** Pp. xiii + 217 with 132 illustrations in the text. Warne. 1968. 12/6.

This is a specially adapted United Kingdom edition of a work first published in Australia in 1966. It is a pupil's guide to practical biology, suitable for 'O' Level candidates. Over 200 problems of very varied character have been posed, some to be solved by first-hand investigation, others by research in the library. Animals chosen for study and dissection include the rat, toad and rabbit, and free use is also made of items available from a butcher, such as hearts, brains and eyes of sheep and cows. There is a useful section on skeletons and movement with references to X-ray photographs and human limb movement. One interesting exercise compares the eye with a camera. Instructions are given for providing a translucent screen at the back of an eye on to which the image of a candle is refracted (*not* reflected as in the text). The exercises on reproduction seem rather impractical. What maternity hospital would welcome a visit from an inquisitive class of schoolchildren? 'It may be possible for you to see a strip film on "Human Reproduction" ' (p. 85). Should this read film-strip?

In contrast with the lively animal problems some of the plant exercises seem dull. Is any useful purpose served at this level in enumerating the descriptive botanical terms for leaf shape or of fruits? There is virtually no fieldwork apart from a section on soils.

The text is clear and substantially free from errors. A number of misleading statements were, however, found: 'Seeds of many plants are produced by the union of detached parts from male and female flowers' (page 13). One of the characteristics of the Bryophyta is that they have 'many celled chlorophyll' (page 17). Most of the diagrams are clear and useful, but some, such as Fig. 6 showing muscle and gland from the neck of a rat as seen with a lens are useless.

My impression is that lively pupils will enjoy this book with its numerous invitations to investigation and exploration. Whether teachers will enjoy it is another matter. From their point of view there may be too many injunctions 'Try to get your teacher to . . . ' Or perhaps teachers have changed. J.W.

Collect, Print and Paint from Nature by **John Hawkinson.** Pp. 61 with numerous black and white and full colour brush drawings. Frederick Muller, 1968. 16/-.

A poorly illustrated little book of doubtful educational value. The information and hints contained are common knowledge to any well-trained teacher, both specialist and non-specialist.

Plants, Man and Life by **Edgar Anderson.** Pp. xiv + 251 with 16 illustrations. University of California Press: agents Cambridge University Press. 19/6.

Good scientists are not always good writers. Edgar Anderson is both. He does not subscribe to the mistaken belief that the duller the book the more academically respectable it is likely to be. It is a pleasure therefore to welcome a new edition of this excellent book which first appeared fifteen years ago. In it Dr. Anderson writes about cultivated crops, plants and weeds. Their origins and history often require for solution evidence provided by cytologists, geneticists, taxonomists, archaeologists, geographers, ethnographers and historians. The very complexity of the problems they raise therefore has been largely responsible for their long neglect. Dr. Anderson has himself contributed notably to techniques appropriate to the problems concerned and has shed light on many dark places. It is a fascinating if baffling story of the piecing together of scattered and fragmentary evidence, much of it still awaiting the collecting and much of it highly relevant to human affairs. This should be required reading for every degree student in botany though it is so admirably written and non-technical that any intelligent adult with only a marginal interest in botany would enjoy reading it. W.A.S.

The Roe Deer of Cranborne Chase by **Richard Prior.** Pp. 218 with 11 pages of photographs and 42 text figures. Oxford University Press. 1968. 50/-.

The description of this work as an ecological survey is rather misleading — it is much more. It is a very full account of the life of Roe Deer as lived in a part of Dorset. The author, with two deer books to his credit already, has assembled such a volume of information on the Roe of Cranborne Chase that this work must, as the publishers suggest, become a classic. The history of the Roe in the area, study techniques, and all aspects of the seasonal and life history are covered. Important chapters cover census work, population structure, management and culling. The appendix by Dr. A. McDiarmid on parasites and diseases is an extremely valuable feature of the book.

With the present increase of the Roe Deer, especially in Yorkshire and other northern counties, and also with the current high level of interest in deer, both by naturalists and sportsmen, this book is very timely. However, if you have any interest in animal communities of any kind you will gain a great deal from Richard Prior's study. T.M.C.

Be a Nature Detective by **Maxwell Knight.** Pp. 174 with 17 black and white photographs and numerous line illustrations by R. B. Davis. Warne. 1968. 21/-.

The late Maxwell Knight was a great inspirer of natural history interest amongst both young and old. Books, films and broadcasts in which he had a hand, blended science with wonder and authority with speculation, and exercised a far-reaching influence. This book covers a lot of ground and throughout urges the reader towards field studies. Tracks and trails, food remains, homes and resting places of a great variety of animals are covered.

All the time the emphasis is on detection and the techniques and discipline of organised observation are used through the whole work. The final chapter on fables and legends presents a new slant on fact gathering for the young naturalist.

This is a book which can be recommended to all young naturalists and a considerable number of older ones also. T.M.C.

The Adjutant. Vol. I, No. I. Published March 1968. 5/-.

The Army Bird-Watching Society was formed in 1961 and has already been publishing quarterly bulletins. Now, under the editorship of Major (Rt'd) C. Worrin, T.D., F.Z.S., M.B.O.U., the first of its annual journals has appeared. Major Worrin is also Secretary/Treasurer of the Society and copies of the journal may be obtained from him c/o Army Apprentices College, Harrogate. The nature of the organisation precludes the possibility of a report based on the customary species list and one is pleased to find instead that the present 22 pages contain short accounts of observations in Oman, Malaysia, Tripolitania, and Guyana. There are notes, too, on the (to British-based ornithologists) more familiar areas of Texel and Falsterbo.

Any ornithologist, whether in the forces or not, who finds himself visiting any of these areas will find the accounts invaluable. Major Worrin is to be congratulated on launching the journal with such a diversity of sources and material.

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THE NATURALIST

A Quarterly Journal

Principally for the North of England

Edited by

W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

with the assistance as referees in special departments of

R. F. Dickens
J. H. Flint, F.L.A., F.R.E.S.
Ellen Hazelwood, F.L.S.
Mrs. Elsie M. Morehouse
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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Published by

THE YORKSHIRE NATURALISTS' UNION

ENTOMOLOGICAL SECTION

Field Meetings, 1969

No formal field meetings have been arranged for the coming season; instead it is hoped to organise more excursions than in the past, but at very short notice with particular attention being paid to weather and collecting prospects. Localities to be visited will be decided upon as the season progresses.

Will anyone (entomologist or non-entomologist), who would like to be kept informed please forward a stamped addressed envelope or, preferably a telephone number to: Mr. P. Skidmore, Museum and Art Gallery, Chequers Road, Doncaster.

WANTED

Will anyone not requiring the copy of *Cortinarius* 1, *Myxacium and Phlegmacium* by P. D. Orton, issued separately with *The Naturalist* for July-September 1955, please send to The Editor, *The Naturalist*, The University, Leeds LS2 9JT.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

FIELD BIOLOGY

The University of London awards a Certificate in Field Biology which is available to all persons interested in the study of living things in their natural habitats. The work involves a directed course of private reading at home, attendance at two Practical Courses each of two weeks held in the Summer of consecutive years, an approved plan of field-work suited to the student's locality to be written up in the form of an essay, and examinations.

The next Practical Course for new students will take place at the Orielton Field Centre, near Pembroke, from 6–20th August 1969. As accommodation is strictly limited early application is advisable.

The regulations and application form may be obtained from the Assistant Director (Room 14), Department of Extra-Mural Studies, University of London, 7 Ridgmount Street, London, W.C.1.

THE NATURALIST

FOR 1969

NATURAL HISTORY

CETACEANS AT SCARBOROUGH

D. E. WHITTAKER

The local fishermen frequently observe large creatures breaking the surface or leaping from the water, but it is usually impossible to ascribe the sightings to any particular species. The Scarborough fishermen are reliably accurate in their descriptions, and readily distinguish a shark sighting from that of a cetacean; the former are usually termed 'Askers' if they are large and unknown, while the latter are called 'Blow-fish'. A 'large' whale was seen on several consecutive days in early September by several local crews and it became the topic of much conversation at the fish-market, but unfortunately I was unable to obtain any useful information about its exact size or form. In May the *Margaret Jane* trawled up a single vertebra of a large cetacean, but the specimen was thrown overboard some days later. While working the same fishing ground one month later, the same crew found the net to be bulging with a section of a whale's lower jaw. The section, which is broken at both ends, is nine feet long and is evidently part of the skeleton of a whalebone whale. Although somewhat pitted and encrusted, the bone is now at Woodend Museum and it is hoped that eventually other parts of the skeleton will be brought to the surface and that these will enable identification of the corpse possible. Other records are:

PORPOISE (*Phocoena phocoena* (L.))

One mature specimen, of undetermined sex, found stranded on the beach at Gristhorpe Bay, 25th February 1963.

One mature female was found washed ashore near the Spa at Scarborough, 14th January 1966. The head was deeply and cleanly lacerated, perhaps wounds from a ship's screw, but otherwise the condition was excellent. When dissected it was found to contain a well-developed foetus, approximately 13″ (330 mm.) long.

One mature specimen, in a very putrid condition, was found washed up among the rocks at Burniston Bay by Mr. C. Ridge in January 1967. It was hidden beneath a pile of rocks by Mr. Ridge and the skeleton was then recovered at a later date and is now at Filey Secondary School in the disarticulated state; the skull is damaged.

One specimen, in a very decomposed state, found among the rocks, 100 yards north of Ravenscar Peak, October 1967.

A single specimen, presumed to be of this species, was seen from the deck of a local keel-boat on 6th June 1968.

A male porpoise calf, 2 ft. 8¼ in. long (819 mm.) was found stranded among the rocks at Hayburn Wyke on 20th June 1968. The specimen had been there for several days, as the skin was badly cut and holed and the viscera were teeming with fly larvae. Although it was impossible to examine the stomach contents, it was assumed that the calf had been subsisting on a milk diet, as the teeth had not yet appeared through the gums; the foetal hairs, which in the porpoise usually number two upon each side of the head, had been lost before death. After soaking the specimen in a tub of formalin for two or three days, a fairly acceptable plaster mould was prepared, and a fibre-glass cast of the calf was made. The cast and the disarticulated skeleton are now in my collection.

An immature female was found dead on the long-lines of the Scarborough coble *Who Cares* on 5th December 1968. The specimen, which was 4′ 8″ long (1449 mm.) and weighed 83 lb., was in excellent condition and had been foul-hooked through one eye; the stomach contained the partially digested remains of seven fish. The local fishermen have recollections of other Porpoises caught on the long-lines in previous years, but are of the opinion that these animals make no attempt to remove the long-line bait, since the majority of specimens found on the lines have invariably been foul-hooked or tangled in the line. As with the above calf, a cast of the specimen has been taken and the skeleton preserved.

A report of a porpoise caught in a salmon-net in Filey Bay was seen in the *Scarborough Evening News* for 4th July. On investigation however, it was found that the unfortunate victim was a tope, one of our smaller sharks.

WHITE-SIDED DOLPHIN (*Lagenorhynchus acutus* (Gray))

On the 23rd September, a party of students found a single female specimen of this species about 500 yards south of Cromer Point, Burniston. It was in such excellent condition that I think it would be safe to assume that it had died within the previous twelve hours. The weight of the dolphin, obtained by weighing large sections of the body during the subsequent skeletonisation process, was 276 lb. The horizontal length, measured accurately by two different methods, was 8 ft. 1⅝ in. (2,480 mm.); the curved length, measured along the mid-dorsal line from the tip of the beak to the notch of the tail flukes, was 8 ft. ½ in. (2,452 mm.). The dorsal surface of the head, the upper lip, beak and the margin of the eye were black, while the lower surface, excluding the grey-brown lower lip, was white. The tongue and palate were also white, but mottled with grey and black. The teeth visible above the gums, numbered 29 on each side of both jaws, the cleaned skull possessing 36 teeth on each side of the upper jaw, while the mandible (broken and chipped slightly at its anterior margin) contained 30 teeth on each side. The back, flippers, dorsal fin, the tail stock and the flukes were also black, and a weak grey stripe ran from the eye to the front angle of the flippers. A yellow-brown stripe ran along the side of the body and tail stock and at its anterior margin it became adjacent to the conspicuous white stripe from which this cetacean derives the common English name. The genital area was black and this so tended to obliterate the positions of the mammary pockets, within which the teats are concealed, that at first glance the specimen was taken to be a male. Colour photographs were taken of the dolphin *in situ* on the beach and it was transferred to the Woodend Museum the next day. A series of detailed measurements was taken, together with plaster moulds of large areas of the body, and these will enable a life-size fibre-glass model of the dolphin to be prepared. An examination of the stomach contents revealed the almost completely digested remains of fish matter, together with pieces of very recently swallowed algal fronds. These pieces, about one to two inches in length, were identified as *Ascophyllum nodosum*, the Egg- or Knotted Wrack. The skeleton, which is in perfect condition, is at present awaiting bleaching and degreasing, but will eventually be mounted with the life-size cast.

All references to the White-sided Dolphin in Yorkshire waters tend to regard the species as an occasional and quite rare visitor. The above specimen is only the fifth to be reported for Yorkshire and a sixth is on record for Skegness. However, around the northern half of the British Isles and North Sea this species is quite abundant, if only during the summer and autumn. It is common in the Arctic Circle, and about the Shetland Isles, Fair Isle, Orkneys and the Scottish coasts. To the west it is regularly seen in the Atlantic off Ireland. In the North Sea it is common off the coasts of Holland and Belgium, and next to the common porpoise is said to be the commonest species in Western Norway. Thus the sighting or stranding of this species in our area cannot be regarded as exceptional; it is probably much more abundant than our records suggest.

Assuming the specimen to have been stranded alive and to have died within very few hours of being found, it is of interest to note that the tide during the previous twelve hours was a high spring-tide, and this presumably accounts for the position of the dolphin high up the beach near the foot of the cliff, where with a 17-ft. high tide, the water would be a foot or more deep. At 5.15 p.m. on 22nd September, the beach would have been flooded to the foot of the cliff, and a cetacean entering the area at this time and becoming confused in the turbid waters of this very rocky area would soon come to grief with the ebbing of the tide, low water being at 11.25 p.m. The carcass would then be carried up the beach by the next high tide (5.20 a.m., 23rd September), and left high and dry on the rocks by 10 a.m. when it was discovered. However, this is mere speculation, but it does illustrate how a healthy cetacean wandering in turbid water and with its echo-location system baffled by a multitude of huge boulders and rocky gulleys, can become stranded with the combination of total darkness and the ebbing of the tide.

Marine Mammals by **Richard J. Harrison** and **Judith King.** Pp. 192 with 12 text figures. Hutchinson University Library, London, 1968. 11/6.

This interesting little book was published in hard covers in 1965 and was reviewed in *The Naturalist*, 1965, p. 98. Now reprinted as a paperback at lower cost it still remains up-to-date and can be warmly recommended to all naturalists. T.K.

E. WILFRED TAYLOR, C.B.E., D.Sc., F.R.S.

At the Annual General Meeting of the Union at Bradford on 7th December 1968, the Executive's recommendation that Dr. E. W. Taylor be elected an Honorary Life Member of the Union was unanimously approved.

Dr. Taylor joined the Union in 1911 and is our oldest member in the sense of continuous membership though certainly not in vitality. He was General Secretary of the Vertebrate Section from 1920–38, President of the Section from 1939–45 and Chairman of the Ornithological Division from 1953–6. For nineteen years he was recorder for birds for the York district and was joint editor with the late Ralph Chislett of the Ornithological records and reports from 1957 to 1959. He was also Chairman of the Mammals, Reptiles, Amphibians and Fishes Committee from 1950–2 and has served continuously as Chairman of the Protection of Birds Act Committee since 1950. In 1955 Dr. Taylor was President of the Union. His Presidential Address which was given at Huddersfield on 3rd December 1955, brought up-to-date the information about Yorkshire mammals which had accrued since the publication in 1881 of Clarke and Roebuck's *Handbook of Yorkshire Vertebrata.*

Immediately after the end of the Second World War Dr. Taylor, together with a small group of naturalists and others concerned for the preservation of the countryside, recognised that the continuous contraction or destruction of areas of natural history interest was likely to be progressively intensified unless active steps were taken in the cause of conservation. Their vision resulted in the formation in 1946 of the Yorkshire Naturalists' Trust and ever since its early years Dr. Taylor has been its Chairman, actively involved in its efforts to secure wide public interest in and support for its work, and in the negotiations for the ever-increasing number of sites of natural history interest which have come under its control. The interests of the Trust and of the Union are closely inter-related and he has always been concerned to strengthen the liaison between the two bodies by all possible means.

In the long history of the Union there have been few who have for so many years given more continuous or more dedicated service to the interests of Yorkshire natural history. Dr. Taylor's election to Honorary Life Membership is an expression of the Union's high personal regard for him, its appreciation of all his past services to the Union and its sincere wish that he will remain active in natural history and conservation work for many years to come.

FIELD NOTES

Oviposition on bramble by the Duke of Burgundy Butterfly

In the vicinity of Kendal, Westmorland, the Duke of Burgundy Butterfly (*Hamearis lucina* (L.)) probably reaches the northern extremity of its range in Britain. Here, on 28th May 1968, I observed a female ovipositing on the leaves of cowslip (*Primula veris* L.), one of its two normal food plants, and also saw a female oviposit on the under surface of a leaf of the bramble (*Rubus fruticosus* agg.). Cowslip and primrose (*Primula vulgaris* Huds.) are the usual food plants of this species, and in none of the several works that I have consulted have I found reference to the use of bramble. The observation therefore seems worth placing on record, not only for its intrinsic interest but because of its possible relevance to speciation phenomena. Only one female was seen to oviposit on bramble, but the number of females in evidence was very few.

Oviposition on bramble, which does not necessarily imply successful feeding by the larvae, may take place elsewhere, and either have gone unrecorded or be unknown to me, but on the other hand it may be related to the fact that this is an isolated and peripheral population. As E. Mayr (*Animal species and evolution* — Harvard Univ. Press, 1963) remarks when discussing the problems of speciation and host change in monophagous species, and which are relevant in the present context, 'the crucial events are apt to take place in peripherally isolated populations and these have not yet been studied adequately in even a single one of the groups of monophagous species'. An animal usually finds ecologically optimal conditions near the centre of its range: in peripheral regions selection pressure is not only more severe but different, and it is here that divergent isolates are most likely to be found. GEOFFREY FRYER

Great Skua taking Coot at Fairburn Ings Nature Reserve

At 12.45 p.m. on 26th October 1968, there was a sudden outcry among the gulls at Fairburn Ings Nature Reserve. As they flew up in a crowd, a dark bird settled on the water. It had a powerful bill and dark plumage and on flapping its wings revealed the clear white mirrors of the Great Skua or Bonxie. It flew low, ignoring the gulls chasing after it, and pounced on a Coot.

The Bonxie seemed to seize the Coot with its feet at the very beginning of the attack. There was a long and desperate struggle, the skua's strong bill wrestling with the Coot which fought like a tiger. They often struggled so violently that the Bonxie itself was half submerged, saving itself by spreading its wings on the water. Throughout, only the Coot's head and shoulders were visible above the surface. It did not dive so the Bonxie must have been gripping it in its feet. Their bills were often locked together, but at last the Coot went limp. The Bonxie pecked at its head, lifting it and letting it drop as if to make sure that it was dead.

For at least half an hour the Bonxie fed on the floating body of the Coot. Other Coots came near to investigate, but soon retired and the Bonxie had a wide area of empty water round it. The Bonxie, a big brown bird with that handsome skua head, drifted slowly, pecking at the dead Coot. A long line of black feathers floated away on the water.

This incident was also witnessed by Mr. W. Blackburn. Coot is recorded in *The Handbook of British Birds* as prey of the Great Skua, but in view of the latter's rarity inland such episodes as the above can seldom have been reported.

GILLIAN GRANGER

Rare Fungus in Leeds

On the 1st August 1968, while photographing colourful Russulas on sloping woodland in the Farnley district of West Leeds, Mr. J. A. Clayton noticed a group of three fungi of peculiar appearance, their caps being broken up by coarse dark scales, suggesting the surface of a pine-cone or pineapple. The underside of the youngest specimen was completely veiled, but a mature example was seen to bear tubes as in Boleti, instead of the expected gills.

Mr. Clayton learned that the rarity was the Pine-cone Fungus *Strobilomyces floccopus* (Vahl. ex Fr.) and some days later Dr. C. J. La Touche and I were shown the site, where two more were found, both in a withered state. There are very few records of this fungus being found in Yorkshire during the present century. Mr. Raymond Booth the artist, found a single specimen early in September 1966 in a roadside plantation near Thorner a few miles from Leeds, and he made a careful sketch of it.

JOHN ARMITAGE

INSECT IDENTIFICATION SERVICE

The Entomological Survey Committee offers to assist with the identification of insect specimens collected by members of Affiliated Societies undertaking survey work. It is not intended to name a long list of common species, but a report will be made dealing with the more interesting ones. Specimens will not be mounted nor can they be returned unless postage is paid. In the first instance specimens should be sent to Mr. J. H. Flint, 7 Norfolk Mount, Leeds 7, who will distribute them to specialists in the various Orders. Advice on how to pack specimens for posting will be given upon application to any member of the Survey Committee.

RESCUE AND RE-INTRODUCTIONS OF THREATENED INSECT SPECIES

The Entomological Survey Committee considers it desirable that naturalists should report any threat to a species with a view to a rescue being effected. Where there is a question of a rescue and/or re-introduction being undertaken it is hoped that the Secretary of the Survey Committee will be first approached to take such steps as he considers appropriate. The Survey Committee are strongly of the opinion that all such activities should be fully recorded in *The Naturalist*.

ROY CROSSLEY,
Hon. Sec., Entomological Survey Committee

THE YORKSHIRE NATURALISTS' UNION
ONE HUNDRED AND SEVENTH ANNUAL REPORT

The Hundred and Sixth Annual Meeting was held on 2nd December 1967, at Barnsley, by invitation of the Barnsley Naturalist and Scientific Society.

The Presidential Address entitled 'Modern Natural History' was delivered by Professor G. C. Varley, and was subsequently published in *The Naturalist*, 73–7, 1968.

The Presidency for 1969 has been offered to and accepted by Miss C. M. Rob, F.L.S.

The Excursions for 1969 will be to:

V.C. 61	Brandesburton Gravel Pits	7th June
V.C. 62	Lastingham	24th–26th May (Whitsun)
V.C. 63	Upper Derwent Valley	21st June
V.C. 64	Halton Gill	19th July
V.C. 65	Jervaulx Abbey	5th–6th July

The highlight of the past year was undoubtedly the very successful symposium held at York University, and jointly sponsored by the Union and the Trust. The theme was 'The Changing Face of Yorkshire' and the lectures, which were greatly appreciated, gave food for thought to many of those present. The success of this conference was largely due to the work of the Trust's Executive Officer.

The sub-committee dealing with the sites of natural history interest in the West Riding area has been able to supply the County Planning Officer with a list of these sites arranged in order of importance. It should be pointed out, however, that this in no way guarantees their conservation though it will ensure that no destruction of any sites will occur through lack of information about them at the Planning Office.

Three issues of the Newsletter have been distributed during the year but the Editor would appreciate more contributions from members and Affiliated Societies.

The unexpected death of Donald Walker has been a severe loss to the Union. His leadership, as Chairman of the Executive, was greatly appreciated by members of the Executive. Many aspects of the Union's activities were given his support and encouragement.

Membership

At the time of writing the membership of the Union comprises one Honorary Life Member, 12 Life Members, 578 Ordinary Members, 51 Associates and 44 Affiliated Societies.

Deaths

We record with regret the death of the following members: K. C. Crosbie, J. Digby Firth, W. G. Fearnsides, H. Heald, H. E. Holmes, R. Tottie and D. F. Walker.

Resignations

T. Anderson, Mrs. W. D. Brooke-Taylor, Miss A. J. Collinge, A. Credland, H. A. Darwood, H. Dickinson, Mrs. W. M. Dobson, Miss R. Dowling, J. Farrand, G. S. Gowing, Miss B. Harthan, C. Jukes, Mrs. M. B. Kirk, P. B. Nicholson, A. F. Owen, J. C. H. Peaker, M. K. Taylor, Miss H. M. Thurston, J. E. White.

New Affiliated Societies

Hornsea Bird Club (Hon. Sec.: A. C. Luckham, 5 Greenacre Park, Hornsea).
Teesmouth Bird Club (Hon. Sec.: Mrs. A. L. Cooper, 85 Junction Road, Norton, Stockton-on-Tees).

Change of Secretary

Harrogate Naturalists' Society (Mrs. D. Haythornthwaite, 'Low Garth', Arkendale, Knaresborough).
Rotherham Naturalists' Society (Mr. G. E. Griffith, 231 East Bawtry Road, Rotherham).
Whitby Naturalists' Society (Mr. H. E. Weston, Manor House, Ugglebarnby, Whitby).

Change of Address

Bennett, G. R., 17 Windermere Close, High Green, Brooke, Norwich, Nor 37W.
Bisiker, T. D., Lindley, 23 Greensleeves Avenue, Broadstone, Dorset.
Briggs, J., Frimley House, Deepdale Close, Slackhead, Beetham, nr. Milnthorpe, Westmorland.
Briscoe, T., Apt. 310, 226 Jogues Street, Sudbury, Ontario, Canada.

Calder, Dr. E. A., Carrs House, New York Lane, Rawdon, nr. Leeds.
Clegg, T. M., City Museum, Albert Square, Dundee.
Critchlow, Dr. A., 60 Sandygate Park, Sheffield, S10 5TZ.
Crookes, H., 62 Cemetery Road, Wath-on-Dearne, nr. Rotherham.
Darnbrough, G. D., 6 Bridge Paddock, Collingham, Wetherby.
Elsworthy, G. D., 14 Greenbank Avenue, Maghull, Liverpool.
Fenton, K., 17 Mill Walk, Snuff Mill Lane, Cottingham, E. Yorks.
Gordon, Dr. G. D., Burnt Yates Bar, Clint, Ripley, Harrogate.
Graddon, W. D., 3 Blake Avenue, Merrivale, Ross-on-Wye.
Grainger, Miss J., Greenacres, Huddersfield Road, Meltham, Huddersfield.
Gunton, T. G., The Lodge, Sandy, Beds.
Hague, J. B., BFES Spandau School, Wavell Barracks, B.F.P.O. 45.
Hamilton, J., 7 Windsor View, Shaw Cross, Dewsbury.
Hardcastle, K., 12 The Bank, Leeming, Oxenhope, Keighley.
Harnett, Mrs. V. M., 17 Congreve Approach, Bardsey, nr. Leeds.
Hartley, Miss M. M., Assistant Keeper, Natural History, Cartwright Hall, Bradford 9.
Humble, Mr. and Mrs. P. A., 'Craigmore', Southfield Road, Burley-in-Wharfedale, Ilkley.
Land, A. E., Brathay Hall Centre, Ambleside, Westmorland.
Lee, J. A., 30 Springfield Road, Gatley, Cheadle, Cheshire.
Magee, L., 4 Park Square, Parklands, Pool-in-Wharfedale, nr. Otley.
Mawby, P. J., 2 The Edinburgh Academy, Arboretum Road, Edinburgh 3.
O'Shea, E. J., 7 Church Terrace, Lewisham, London S.E.13.
Palmer, M. J., 94 Crag Court, Mixenden, Halifax.
Parkinson, R. C., Flat 4, 10 Crossbeck Road, Ilkley.
Pearce, Rev. E. J., House of the Resurrection, Mirfield.
Penrose, R. J., Natural History Section, Bankfield Museum, Halifax.
Ping, A. W., Flat No. 1, Aldersyde Court, Dringhouses, York, YO2 2QN.
Robertson, Prof. N. F., School of Agriculture, West Mains Road, Edinburgh 3.
Smith, C. C., 56 Girton Road, Cambridge, CB3 0LL.
Stuttard, P., 65 Church Road, Willesborough, Ashford, Kent.
Swallow, P., 19 Broomfield, Adel, Leeds, LS16 6AE.
Tetley, Miss M. I., 2 Bodden Croft, Fernleigh Road, Grange-over-Sands, Lancs.
Winter, P. Q., 1 Cook's Row, West Street, Muston, Filey.
Wood, Miss F., 11 Sunningdale Mount, Ecclesall, Sheffield 11.
Wray, Miss M., The Bield, Low Laithe, Summerbridge, Harrogate.

New Members

Archer, M. E., B.SC., F.R.E.S., 17 Elmfield Terrace, Monk Stray, York (E).
Barton, B. J., 58 Manston Avenue, Leeds 15 (O).
Bowring, W., Pinfold House, Carleton Green, Pontefract (B.Z).
Colville, Dr. B., 26 North Parade, Leeds 16 (C.Z).
Cozens, F. H., 57 Greencourt Road, Petts Wood, Orpington, Kent (B.M).
Dickinson, Dr. C. H., Dept. of Botany, University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU (M).
Feather, K. P., Lumb Ghyll, Crosshills, nr. Keighley (Z).
Fleming, J., Farm Cottage, Rockwood, Gargrave Road, Skipton (O.Z).
Fotherby, D. I., 20 Woodall Avenue, Scarborough (B.Z).
Ginz, E. D., F.C.A., 30 Hazel Beck, Beckfoot, Bingley.
Hamilton, J., 159 Smithy Parade, Valley Road, Thornhill, Dewsbury.
Harrison, Miss Janet E., 1 Weelsby Way, Hessle.
Harrison, R. F., A.M.A., Director, Museum & Art Gallery Service for Yorkshire & Humberside, Farnley Hall, Leeds 12.
Hodgson, M. G., 1 Driffield Road, Molescroft, Beverley (O).
Johnson, Mrs. D., Oakerbank Farm, Skipton Road, Killinghall, nr. Harrogate.
Knight, J. E., 76 Thames Avenue, Guisborough (O.Z).
Limbert, G., 57 Queen's Park Drive, Airedale, Castleford (O).
Little, E. R. B., M.A., F.L.S., 6 Jellicoe House, Compass Road, Hull (Br.).
Marsden, Dr. C., 77 Oldfield Road, Stannington, Sheffield (B.E.O).
Massey, C. I., 14 Meadow Drive, E. Ayton, Scarborough.
Newman, Lt.-Col. J. F., St. Fillans, 88 Shipton Road, York (O).
Owen, Capt. D. B., 16 Redcliff Drive, North Ferriby (O).

Peel, Miss Enid F., Oakridge, Summerbridge, Harrogate (O).
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Proctor, D., Lyndhurst, Woodbine Street, Ossett.
Shimeld, Mrs. M. E., 7 Glenview Grove, Nab Wood, Shipley (O).
Smeed, J. A., 20 Grove Lane, Knottingley (O).
Smith, A. E., B.SC., Fleetway, 270 London Road, Wyberton, Boston, Lincs. (E).
Steven, Miss Isobel J., Marimba, Studley Road, Ripon (B.O).
Steven, R. M. (A).
Taylor, Miss M., Resident Staff, East Riding General Hospital, Driffield (B).
Thorogood, D., 49 Oaklands Avenue, Colchester, Essex (O).
Thrussell, G., 3 Heights Green, Leeds 12 (O).
Walker, J., 48 School Street, Moldgreen, Huddersfield, HD5 8AU.
Walker, K. R., 'Sycamores', Welton Road, Brough (B).
Wallis, A. W., 54 Westminster Avenue, Holderness Road, Hull (O).

MAMMALS, REPTILES, AMPHIBIANS AND FISHES

C. SIMMS

This report was compiled in November 1968; the recording year is thus November to October inclusive. Substantial numbers of records have come only from the Scarborough and York observers. Records from relevant papers, e.g. D. Whitaker on Marine Fishes (*Nat.*, 906, p. 78) and from Union field meetings reports (*Nat.*, 907, pp. 119, 123), published during the year under review, will not be repeated here. Relevant publications in press or in preparation include: *Amphibia* — Hazelwood (*Brit. J. Herpet.*), Simms (*Brit. J. Herpet.*). *Cetacea* — Massey (*Nat.*), *General* (flood effects) — Radley and Simms. Unconfirmed reports will be held over until resolved; increasing numbers of 'escapes' account for some of these.

MAMMALIA

INSECTIVORA: Reports of the Hedgehog and Mole are few, except that C.I.M. continues his road mortality study of the former. The same observer has a long list of Common Shrew records from the Scarborough area and of Pigmy Shrews from Sherburn Ings, Raindale, Ganton, East Ayton and Hutton Buscel, together with Water Shrews from the four places last named and also Wykeham and Scarborough itself. C.A.S. reports Pigmy Shrew 'frequently between May and September' (*in litt.*) at Flaxton, and with further records from Riccall, Sand Hutton and near Northallerton (C.S.) this species is better recorded.

CHIROPTERA: Little attention is given to this group. C.I.M. reports three Pipistrelles in the Scarborough–Scalby area but all other confirmed records to date are of single specimens. These are of Whiskered Bat at Skelton near York (M.J.A.T.), Daubenton's Bat from Camblesforth, Noctule and Barbastelle from York (C.S.). A November 1967 *Plecotus* corpse from Snaith was determined as *auritus* (L) — the Common Long-eared Bat, by Dr. G. B. Corbet.

CARNIVORA: Inconsistently worked, with one recorder attempting too much ground in a single-species survey. The Fox is abundant in many places, but statements of 'increase' or 'decrease' seem poorly based. Stoats and Weasels are little-recorded but should not be taken for granted. Feral ferrets have been killed at Stamford Bridge, unsuccessfully hunted at Flaxton (December 1967) and killed in York (C.S.) but that other feral mustelid, the American Mink, is clearly breeding in Sutton-on-Forest parish and probably elsewhere (C.S. and Y.G.) and continues to be noted at Silkstone (per T.M.C.). Sight records of mink are to hand from Aldwark, Elvington, Escrick and Myton in the Vale of York, and Scampston and Seamer in the Vale of Pickering (C.S. and Y.G.) whilst C.I.M. reports both Mink and Otter from the Esk near Grosmont. The Otter is not scarce and has bred in at least eight Vale of York stations, as no doubt also elsewhere (C.S.). C.I.M. has a long list of reports of Badger from the Scarborough district, but this species badly needs a V.C. 61 recorder. C.I.M. lists locations of setts in his district which will not be repeated here but should go to the appropriate Mammal Society vice-county recorder.

PINNIPEDIA: There are interesting records of Grey Seals to hand from C.I.M. and C.S. which will be reported on in due course. The Common Seal had been seen in Scarborough harbour on 21st and 24th February (C.I.M.).

UNGULATA: Roe are reported from the Howardian Hills (Y.G.).

LAGOMORPHA: There are, surprisingly, no useful records of these to hand this year.

Rodentia: The Red Squirrel has been introduced or re-introduced here and there, but there are few records of Red or Grey Squirrels to hand. Clearly there are pockets of Red in several places in the lowlands (some of which, at least, are the result of introduced Continental stock) whilst this species is still to be seen in parts of the Pennines — particularly towards the S.W. and N.W. borders of the county. It is now many years since the Dormouse and Harvest Mouse were reliably recorded from Yorkshire, and there appear to be no records of the Yellownecked Mouse, *Apodemus flavicollis* (Melchior). More attention to the small rodents might turn one or other of these up.

Cetacea: Records here are confined to strandings. A Porpoise is reported from Ravenscar on 22nd October 1967, and another at Hayburn Wyke in June 1968 (C.I.M.). A White-Sided Dolphin in Jackson's Bay, Scarborough, on 23rd September 1968, is the subject of a note to be contributed to *The Naturalist* (C.I.M.). During the third week of August 1968, a Killer Whale (about 21 ft.) seems to have come ashore more than once, and came to rest near Kettleness (C.S.)

REPTILIA

British and/or imported specimens of the following native species have been sold in the county this year: Slow Worm, Common Lizard, Grass Snake. *All* reported occurrences must be very closely scrutinised. *Lacerta* and *Natrix* spp. are often wrongly named by *bona-fide* naturalists. The V.C. 61 Tessellated Snakes have not been found this year, but there are unconfirmed reports of Sand Lizards from a V.C. 62 locality.

Slow Worm: C.I.M. has well-localised records from Glaisdale and near Scarborough. A chain of new localities across the Vale of York and two new localities near the Notts. border (C.S.) are apparently isolated stations.

Common Lizard: A good season, with a crop of new localities in the Scarborough (C.I.M.) and Cleveland (C.S.) districts.

Grass Snake: No further V.C. 61 stations are reported but there are several 'new' ones near Selby, Thorne and Doncaster and a late Lower Farndale discovery(C.S.). This last confirms a recent but undated report from M.B. T.M.C. describes the Y.N.T. reserve at Denaby Ings as 'a stronghold of the species' (*in litt.*).

Viper: C.I.M. has records from Scalby, Allerston and Fen Bog. On the levels east of Doncaster it has been encouraging to see the good hold this species has, and how well it is known by some local naturalists.

AMPHIBIA

Only the Scarborough district appears to have been really well worked this year, by C.I.M.

Newts: Very few records from outside V.C. 62 indicate abundant scope for local surveys. C.I.M. has records of the Palmate Newt from Langdale End and Raindale; C.S. from Scugdale and Newtondale (where it is abundant at Fen Bog).

Toads: The Common Toad is reported from much of the Scarborough district (C.I.M.); scanty reports elsewhere. The writer has yet to see a Yorkshire-taken Natterjack Toad and suggests that the old records need close attention.

Frogs: The Scarborough district (C.I.M.) supplied many dated stations for the Common Frog; a very encouraging sign. Attention should be paid to breeding success this coming season; Mrs. Hazelwood would welcome reports.

PISCES

Marine fishes later than those covered by Whitaker (*op. cit.*) will be reported on next year. Most records have been abstracted from the angling press by C.I.M. and very few can be mentioned here.

Salmon: Increased numbers of reports from the Ouse system (including a 32 lb. specimen at Boroughbridge) are not necessarily indicators of less pollution; there have been introductions of this and the following two species.

Brown Trout: A good season is reported from most waters.

Grayling: Has been taken in the Ouse and can be expected in almost any Vale river.

CONTRIBUTORS

T. M. Clegg, C. I. Massey, C. Sims, C. A. Street and the York Group (Y.G.) — P. Balch, M. Buckler, Miss S. Crompton and M. J. A. Thompson.

ORNITHOLOGY

(M. Densley): Two full Sectional meetings were held during the year, both in conjunction with the Mammals, Reptiles, Amphibians and Fishes Section. These meetings were held in March at York, and at Leeds in October. The meeting at York was a departure from the usual tradition of holding both meetings in Leeds, and the March Sectional meeting next year will be held in Scarborough. The meeting in October will be held as usual in Leeds.

At both these meetings Mr. Wallis outlined events of ornithological interest in the county. Roller, Nutcracker, Red Kite, Red Footed Falcon and Sabine's gulls were notable species mentioned, and Mr. Wallis stated that a good breeding season had taken place, particularly for small birds. He expressed a regret that the County Ornithological report had been further delayed in its appearance, but hoped that the reports for 1965 and 1966 would shortly be available to members.

Mr. Cudworth spoke on Spurn Observatory matters at the October meeting, as Mr. Fenton, the Hon. Secretary, was unable to attend. Mr. Fenton had outlined the spring activities at Spurn at the March meeting. A number of new species for Spurn had occurred, Bee Eater and Nutcracker, and spring and autumn Subalpine Warbers there, were also new for the county. A Spectacled Warbler which appeared shortly after the October meeting was a new bird for Britain. Unsuccessful breeding of Little Terns again occurred, this time due apparently to natural causes. By contrast, a course for ringers at Spurn in September, run by the British Trust for Ornithology, was most successful.

Again an annual report for the Observatory has appeared.

Among numerous activities of the Protection of Birds Act sub-committee was the circulation to schools of protection posters, which has proved most useful in the past. Co-operation was reported between the committee and local representatives of national bodies concerned with protection. The death of Donald Walker has been a grievous blow to the cause of bird protection in the county. A new appeal for funds to assist the functioning of this committee was made by its Secretary, Mr. Wilson, at the October meeting. These should be sent to the treasurer, Mr. Disbrey.

A summary of various aspects of the laws affecting wild birds was prepared by Mr. Wilson, and appeared in *The Naturalist*.

Among the formal and informal meetings of the Reports sub-committee was one between themselves and local representatives of the British Trust for Ornithology concering the organisation of the Trust's 'Atlas of British Birds' project. The committee also recommended the name of C. Bower of Barnsley as a replacement for J. Cudworth, who had asked to be relieved of his position as Recorder for V.C. 63.

Another sea-bird-watching cruise from Scarborough was ably organised by Mr. Wallis in the early autumn. This was well supported by members, and the weather was most kind.

Members of the Section were represented in both audience and list of speakers at the joint symposium of Y.N.U. and Y.N.T. in mid-September at York. The topic was 'The Changing Face of Yorkshire'.

In conjunction with the Bradford Naturalist's Society, the section arranged in early November a showing of colour films made by the well-known Norfolk naturalist, Mr. R. P. Bagnall-Oakley, who gave a live commentary to his films. We are indebted again to Mrs. Butcher and Mr. Fenton for their efforts to make this event the success that it was. The showing of new R.S.P.B. films in the county during November was again a feature of the autumn and winter agendas of a number of local societies.

It is unfortunate that two consecutive annual Ornithological Section reports should contain resignations on the part of the Sections' Hon. Secretary. However, it is with some regret that I have to resign my position after only one year due to other commitments, and inform all members of the Section that from the end of the year the new Hon. Secretary will be: J. F. Roberts, 14 Lynhurst Grove, Brighouse, Yorkshire. Tel: Brighouse 4068.

CONCHOLOGY

(E. Dearing): There have been four indoor meetings during the year: a lively discussion meeting on 'The Larger British Bivalves' in January was well supported and followed in February by a lecture by Mr. J. F. M. de Bartolome. This was a masterly discourse on the genus *Murella* of which the speaker has a personal knowledge without parallel. Exhibits of all species mentioned, taken on many excursions to the Western Mediterranean, showed the wide range of form to be found in this single genus. Mrs. N. F. McMillan opened a discussion on 'The Mollusca of Canals' in March; she traced the development of the canal system and gave some details of her recent work in the Lancashire area.

Field meetings have been well attended although one which was to have been a joint arrangement with the Lancashire conchologists in September had to be postponed until next season. Collecting in the River Fosse at York was rather disappointing but a visit to a nearby brick-pond produced an abundance of *Anadonta cygnea* to Mr. A. Norris' newly-designed dredge. The Gateforth and Birkin meeting yielded a good number of species, whilst the October meeting to Tadcaster arranged by Mr. J. Summerton commenced with a visit to the local museum, followed by lunch and an afternoon session collecting in brick-ponds, by kind permission of local landowners.

Mr. J. Armitage spoke on 'Succineas' at the Annual Meeting and showed excellent specimens of many species.

It is with regret that we note the passing of one of our oldest members, Mr. J. Digby Firth, who had been associated with the Section since 1908.

Field Meeting Records: (1) York, 6th April 1968; (2) Birkin near Selby, 4th May 1968; (3) Tadcaster, 5th October 1968.

Viviparus viviparus (L.), 1
V. fasciatus (Müller), 2
Valvata cristata Müller, 1, 3
V. piscinalis (Müller), 2
Potamopyrgus jenkinsi (Smith), 2
Bithynia tentaculata (L.), 1, 2
B. leachi (Sheppard), 2
Carychium minimum Müller, 2, 3
Lymnaea truncatula (Müller), 2
L. glabra (Müller), 2
L. palustris (Müller), 2
L. stagnalis (L.), 1, 2
L. peregra (Müller), 1, 2
L. auricularia (L.), 1
Physa fontinalis (L.), 1, 2
Planorbarius corneus (L.), 1, 2
Planorbis planorbis (L.), 2, 3
P. vortex (L.), 1, 2
P. leucostoma Millet, 2
P. albus Müller, 1, 2
P. contortus (L.), 2
Segmentina complanata (L.), 2, 3
Acroloxus lacustris (L.), 1, 2
Succinea putris (L.), 1, 2
S. pfeifferi Rossmässler, 2, 3
Cochlicopa lubrica (Müller), 2, 3
C. lubricella (Stabile), 1, 2
Vallonia pulchella (Müller), 2, 3
V. excentrica Sterki, 2, 3
Clausilia bidentata (Ström), 2, 3
Arianta arbustorum (L.), 1
Helix hortensis Müller, 1
H. nemoralis L., 1, 2, 3
Helix aspersa Müller, 1, 2, 3
Hygromia striolata (C. Pfeiffer), 3
H. hispida (L.), 1, 2, 3
Monacha cantiana (Montagu), 1, 2, 3
Discus rotundatus (Müller), 1, 2, 3
Arion intermedius Normand, 2, 3
A. circumscriptus Johnston, 2, 3
A. hortensis Férussac, 1, 3
A. ater (L.) agg., 2
Vitrea crystallina (Müller), 2
Oxychilus draparnaldi (Beck), 1
O. cellarius (Müller), 1, 3
O. alliarius (Miller), 3
O. helveticus (Blum), 3
Retinella radiatula (Alder), 2, 3
R. pura (Alder), 3
R. nitidula (Drap.), 1, 2, 3
Zonitoides nitidus (Müller), 1, 2
Vitrina pellucida (Müller), 2, 3
Milax budapestensis (Hazay), 1, 3
Limax maximus L., 3
Agriolimax reticulatus (Müller), 1, 2, 3
A. laevis (Müller), 2, 3
Anadonta cygnea (L.), 1
A. anatina (L.), 1, 2
Sphaerium corneum (L.), 1, 2, 3
S. lacustre (Müller), 2, 3
Pisidium casertanum (Poli), 3
P. personatum Malm, 3
P. subtruncatum Malm, 2
P. henslowanum (Sheppard), 2
P. nitidum Jenyns, 2

Nomenclature is according to the 1951 Census of the Conchological Society of Great Britain and Ireland. The records are collated by Mr. A. Norris.

ENTOMOLOGY

Coleoptera (E. W. Aubrook): While the number of records in the following list is less than in recent years, some interesting species are included. Master Jeremy D. H. Flint's consistent work with the water net has produced many water-beetles which have confirmed old records and extended the known range of other species in

Yorkshire. Of particular interest is his *Hydroporus longicornis* which has been recorded less than a dozen times in Britain.

It is interesting to note that the weevil *Euophryum confine*, originally described from New Zealand and first recorded in Britain in 1942, has now been found abundantly in the West Riding.

The publication of a note by Mr. A. A. Allen (*Ent. mon. Mag.*, **104**, 110–12, 1968) on *Plegaderus vulneratus*, a Histerid beetle new to Britain and recorded from single localities in Surrey, Berkshire and Yorkshire, has now made it possible to publish the Yorkshire records here.

I am indebted to the following for records: Mr. R. Crossley, Mr. J. H. Flint, Mrs. H. E. Flint, Master J. D. H. Flint, Mr. F. Hawkin, Lt.-Col. J. Newman and Mr. P. Skidmore. Of the species listed below, five are additions to the county list (†) and eleven to vice-counties (*).

Carabus nitens L. (62) Danby Moor, 1968; Strensall Common, 1968; J.N.

Lyperosomus angustatus Dufts. (63) Haw Park, 7/9/68; J.H.F.

**Synuchus nivalis* Pz. (65) Bellarby, 4/7/64; E.W.A.

**Hydroporus longicornis* Shp. (62) Strensall Common, 16/6/68; J.D.H.F. The second Yorkshire record of this rare and little-known species.

Agabus undulatus Schr. (64) Askham Bog, 29/10/67; J.D.H.F. A small colony in a very restricted length of ditch.

A. affinis Payk. (61) Skipwith Common, 25/5/68; J.D.H.F.

**Dytiscus circumcinctus* Ahr. (62) Strensall, 4/68, a smooth female; J.D.H.F.

Ochthebius minimus F. (64) Queen Mary's Dub, Ripon, 4/9/68; E.W.A.

**Berosus affinis* Brull. (63) Potteric Carr, 26/5/68; J.D.H.F.

**Lithocharis nigriceps* Fr. (61) Pocklington Canal, 15/6/68; E.W.A.

**Quedius fulvicollis* Steph. (64) Breary Marsh, Bramhope, 2/2/64; and Hetchell Wood Reserve, 17/2/68; J.H.F. One previous record.

†*Mycetoporus splendens* Marsh. (64) Whernside, 29/5/66; J.H.F.

**Acritus nigricornis* Hoff. (64) Queen Mary's Dub, Ripon, 4/9/68; E.W.A.

†*Plegaderus vulneratus* Pz. (63) Discovered in great abundance in old workings of *Hylurgops palliatus* beneath the bark of dead *Pinus* at Cantley and Sandall Beat Wood in April 1966; P.S. The Cantley site has since been destroyed due to the extension of the Cantley housing estate, but the insect is still abundant in Sandall Beat on trees in just the right state of decay. This beetle has only just been placed on the British List (Allen, *loc. cit.*) and is only known from Oxshott (Surrey), Silwood Park (Berkshire) and the Yorkshire localities mentioned above.

Carpophilus marginellus Motsch. (63) Greenfield, 1967; L. N. Kidd. Only recorded from Huddersfield.

Cartodera elongata Curt. (63) Thurstonland, in cellar, 10/68; E.W.A.

**Scymnus nigrinus* Kug. (63) Haw Park, 7/9/68; J.H.F.

Harmonia quadripunctata Pont. (63) Haw Park, 7/9/68; J.H.F.

Ochina ptinoides Marsh. (64) Healaugh, in old *Hedera* stems, 18/2/68; J.H.F.

**Salpingus castaneus* Pz. (63) Farnley Tyas, 17/7/66; E.W.A.

**Bruchus loti* Pk. (63) Stocksmoor Reserve, 9/6/68; E.W.A.

†*Apion minimum* Hbst. (62) Strensall Common, 28/5/66; J.H.F.

**Pentarthrus huttoni* Woll. (63) Ravensknowle, Huddersfield, in old timber in stables, 3/68; E.W.A.

†*Euophryum confine* Broun. (63) Ravensknowle, Huddersfield, with previous species, 3/68; E.W.A.

†*Ceuthorrhynchus marginatus* Payk. (63) Farnley Moor, near Huddersfield, 18/6/60; E.W.A.

Hemiptera (J. H. Flint): There has been more activity in the county than ever before by entomologists working in this Order. Another encouraging feature is that the records come from widely separated areas, although, as usual, vice-county 65 has been completely neglected. Some of the species listed below are quite common ones which have nevertheless not been recorded previously in particular vice-counties but most of the new records are of local or rarely-found species. An example of the latter is the curious *Empicoris vagabundus* which has only been noted five times before in Yorkshire, probably because it is so difficult to see on an old wall or tree trunk where it hunts for psocids and aphids; it overwinters in old ivy, from which it may not be easily dislodged.

The most notable result of the year's work is the discovery of *Anthocoris limbatus* in Yorkshire and of a new locality for *Capsus wagneri*, both due to Mr. R. Crossley. *A. limbatus* is a fenland bug which previously was unknown north of Cambridgeshire. The existence of a colony on old sallows at Wilthorpe Marsh near Barnsley is most remarkable and can be connected with the occurrence of other fenland insects further down the Dearne Valley. A discovery like this is a salutory reminder of how rewarding search in unpromising-looking surroundings can be. *Capsus wagneri* is another notable fenland insect and its only known British haunts were Askham Bog, where it is plentiful, and Wicken Fen, until Mr. Crossley found a single male in the marshes beside the Pocklington Canal near Melbourne. Perhaps diligent search of other marshy areas on the flat central plain of York will yield further localities.

I am grateful for lists of records, or sometimes specimens, from Mr. D. Barnes, Mr. R. Crossley, Mrs. H. E. Flint, Master Jeremy D. H. Flint and Mr. P. Skidmore.

In the following list two species are additions to the county list and twenty-one are new vice-county records.

HETEROPTERA

Aradus depressus (F.) (63) Sandall Beat Wood, 25/5/66 and Denaby Ings, several about mycetozoan on rotten branch of *Salix fragilis*; P.S.

Zicrona coerulea (L.) (63) Broadhead Clough, 23/7/67; R.C.

†*Sehirus bicolor* (L.) (63) Adwick-le-Street, 21/10/68; H. E. Beaumont.

Myrmus miriformis (Fall.) (63) Hatfield Lings, 1/7/65; P.S.

Kleidocerys truncatulus s. ericae (Hor.) (63) Hatfield Lings, on *Calluna,* 1/7/67; P.S. Hatfield Moor, 29/6/68; R.C.

**Stygnocoris rusticus* (Fall.) (61) Spurn, 13/8/66; C. Devlin (P.S.).

Empicoris vagabundus (L.) (64) Ribston Park, three beaten from old ivy on a tree, 29/9/68; J.H.F.

E. culiciformis (Deg.) (64) Chapel Allerton, Leeds, one in a bedroom, 22/11/67; J.D.H.F.

**Dolichonabis lineatus* (Dahl.) (63) Thorne Moors, 14/7/63; T. M. Clegg (P.S.). The only other Yorkshire record is from Kilnsea Saltings.

†*Anthocoris limbatus* (Fieb.) (63) Wilthorpe Marsh, Barnsley, 25 and 28/4/68, 19/5/68, females only; 7/7/68, 6/10/68, both sexes; R.C.

**Orius niger* s. *compressicornis* (Sahl.) (62) Strensall, 17/4/68; D. B.

**Deraeocoris ruber* (L.) (63) Doncaster, abundantly on nettles, 8/68; P.S. West Melton, 8/68; H. E. Beaumont.

Lopus decolor (Fall.) (63) Wilthorpe Marsh, 7/67; Hatfield Moor, 7/67; R.C.

**Hoplomachus thunbergi* (Fall.) (62) Ellerburn Bank, Thornton Dale, 14/7/68; H.E.F. This is the most northerly British record; the only previous Yorkshire locality recorded is Ripon.

**Tinicephalus hortulanus* (M.-D.) (63) Brockadale, Wentbridge, 28/7/68; R.C. Hetchell Wood and Grass Wood are the only other records.

Megalocoleus pilosus (Schrk.) (63) Haw Park, on tansy (*Tanacetum*), 24/7/67; R.C.

**Plagiognathus albipennis* (Fall.) (63) Quarmby, Huddersfield, on wormwood (*Artemisia*), 21/9/65; R.C.

**P. chrysanthemi* (Wolff) (63) Hatfield Moor, 15/7/67; Wilthorpe Marsh, 8/67; R.C.

**Dicyphus globulifer* (Fall.) (63) Bretton Park, 22/5/67; R.C.; Blaxton Common, 11/6/68; P.S.

Globiceps flavomaculatus (F.) (63) Thorne, 25/6/67; Hatfield Moor, 29/6/68; R.C.

**Orthotylus virescens* (D. and S.) (63) Hatfield Moor, 15/7/67; R.C.

**Lygocoris lucorum* (M.-D.) (63) Quarmby, Huddersfield, 21/9/65; R.C.

**Polymerus nigritus* (Fall.) (63) Brockadale, on goosegrass (*G. aparine*), 28/7/68; R.C. Potteric Carr, July 1965; P.S.

Megacoelum infusum (H.-S.) (63) Haw Park, on oak (*Quercus*), 7/9/68; J.H.F.

Stenotus binotatus (F.) (63) Hatfield Moor, 15/7/67; R.C. Sprotborough; P.S.

**Capsus wagneri* Rem. (61) Melbourne, marshes by Pocklington Canal, one male, 20/7/68; R.C.

Megaloceraea recticornis (Geoff.) (63) Hatfield Moor, 15/7/67; R.C.

**Salda muelleri* (Gmel.) (63) Hingliff Hill, Langsett, from *Sphagnum*, altitude c. 1,100 ft., 26/8/68; R.C. This and the following are considered to be rare insects but appear to be much more widespread on high moors than was believed. They are often very numerous when located.

S. morio Zett. (63) Hingliff Hill, with the above. Also Cold Edge, Halifax, on bare peat at altitude c. 1,200 ft., 10/8/68; R.C.

**Hebrus ruficeps* (Thoms.) (62) Strensall Common, abundant among *Sphagnum* on the edges of a pond, 9/6/68; J.D.H.F.

Velia caprai Tam. (64) Blea Moor, above Ribblehead, one macropter among a colony of apters, 7/6/68; J.H.F.

Microvelia reticulata (Burm.) (62) Strensall Common, one macropter among an abundance of apters, 16/6/68; J.D.H.F. (63) Wilthorpe, on the canal, 29/10/67; R.C.

Corixa panzeri (Fieb.) (61) Pocklington Canal at Melbourne, 15/6/68; J.D.H.F. (64) Askham Richard, 10/3/68; D.B.

Hesperocorixa castanea (Thoms.) (62) Strensall Common, abundant, 5/4/68; J.H.F. (*63) Langsett, in a quarry pond, 3/67, 3/68; R.C. (64) Ribblehead, 7/6/68; J.D.H.F.

Sigara venusta (D. and S.) (63) Langsett, quarry pond, 3/67; R.C.

S. semistriata (Fieb.) (61) Skipwith Common, 24/3/67; R.C.

HOMOPTERA

**Speudotettix subfusculus* (Fall.) (61) Skipwith Common, 4/5/68; J.H.F.

Eurhadina loewi (Then) (64) Ribston Park, a female beaten from sycamore (*Acer pseudoplatanus*), 29/9/68; J.H.F.

**Eupteryx notata* Curt. (63) Sandall Beat, 29/5/68; J.H.F.

**Delphacinus mesomelas* (Boh.) (62) Strensall Common, 9/6/68; J.H.F. Ellerburn Bank, 14/7/68; H.E.F.

**Eurysa lineata* (Perr.) (63) Potteric Carr, 24/5/68; P.S.

**Javesella dubia* (Kirsch.) (63) Denaby Ings, abundantly, 29/5/68; Sandall Beat, 29/5/68; J.H.F.

Paraliburnia lugubrina (Boh.) (63) Denaby Ings, abundantly, 29/5/68; J.H.F. The only other known Yorkshire locality is Sprotborough Flash and these two are the most northerly known British records.

Hymenoptera (Mrs. H. E. Flint): From observations in my own garden it would appear that the very fine weather in the early part of the season gave the social insects in this group a good start and there have been large numbers of the common *Bombus* and *Vespula* species throughout the summer. This also has been a good year for the collectors in spite of poor weather on the organised excursions of the Section. It is very encouraging to have so many people actively interested in this Order and between us we have produced a number of notable records for the county and vice-counties. The compiling of comprehensive lists for specific sites has resulted in many insects or records being given to me. As usual, much of the material collected during the year still remains to be identified.

I am particularly indebted this year to Mr. P. Skidmore for a long list of records of sawflies and to Mr. A. H. Wright for sawfly larvae taken whilst searching for lepidopterous larvae. I would also like to thank the following people whose initials appear in the lists for their contributions: Messrs. M. T. Brook, R. Crossley, J. H. Flint, R. Harris. Determinations of Aculeata are by Mr. Flint; all others by the collectors except where the initials of the person responsible for determinations are given in brackets.

SYMPHYTA

**Pamphilius hortorum* (Klug) (63) Sandall Beat, 5/67, 5/68; P.S.

P. inanitus (Vill.) (64) Hetchell Wood, 4/6/68; H.E.F.

†*Xyphidria prolongata* (Geoff.) (63) Denaby Ings, dead adults in old willows which contained abundant larval workings, 8/3/66; P.S. (*Entomologist*, 1966: 229).

Sirex cyaneus (F.) (63) Wath-on-Dearne, one fem. on new housing estate, 8/68; H. E. Beaumont (P.S.). (64) Barwick-in-Elmet, one fem., 3/9/68; R.H. (H.E.F.).

**Hartigia linearis* (Schr.) (64) Mackershaw Wood, Ripon, 16/7/67; H.E.F.

Arge cyanocrocea (Forst.) (62) Strensall, 9/6/68; J.H.F. (63) Blaxton Common, 29/6/67; P.S.

**Zaraea fasciata* (L.) (64) Barwick-in-Elmet, 13/6/68; R.H. (H.E.F.). The only previous record of this conspicuous sawfly in Yorkshire is in the Victoria County History (Newmillerdam).

Cimbex femoratus (L.) (64) Barwick-in-Elmet, an adult female, 10/8/68; R.H. (H.E.F.).

**Trichiosoma tibiale* Steph. (63) Horbury, 5/67; M.T.B. (H.E.F.).

**Selandria sixii* Voll. (61) Banks of Pocklington Canal, Melbourne, 15/6/68; H.E.F.

Dolerus ferrugatus Lep. (63) Denaby Ings, 11/5/68; P.S.

Heterarthrus vagans (Fall.) (63) Potteric Carr, 30/5/68; C. Devlin (P.S.).

**Empria baltica* Conde (63) Potteric Carr, 24/5/68; P.S.

E. tridens (Kon.) (64) Hetchell Wood, 18/4/61; H.E.F. (J.H.F.).

†*Ametastegia albipes* (Thoms.) (61) Skipwith Common, 25/5/68; P.S.

**Allantus togatus* (Pz.) (63) Haw Park, 7/67; J.H.F. The only previous record in Yorkshire is from Everingham.

**A. rufocinctus* (Retz.) (63) Sandbeck, 9/6/66; P.S. Only previously from Robin Hood's Bay.

Rhadinoceraea micans (Klug) (63) Potteric Carr, abundant on *Iris*, 24/5/68; P.S.

Tenthredopsis excisa (Thoms.) (62) Strensall Common, commonly, 9/6/68; H.E.F.

Rhogogaster genistae Benson (63) Blaxton Common, one swept from broom (*Sarothamnus*), 11/6/68; C. Devlin (P.S.).

Tenthredo colon Klug (63) Gunthwaite, 3/6/66; P.S.

T. vespa Retz. (62) Ellerburn Bank, Thornton Dale, 17/7/68; H.E.F.

**Pachyprotasis antennata* (Lep.) (63) Thorne Waste, 25/6/67; H.E.F. Only twice before in Yorkshire.

**Macrophya ribis* (Schr.) (63) Wilthorpe Marsh, Barnsley, 2/7/67; P.S.

**Hoplocampa pectoralis* (Thoms.) (63) Potteric Carr, 24/5/68; P.S.

†*Stauronematus compressicornis* (F.) (63) Haw Park, one larva which produced the typical 'palisade' of dried saliva around its feeding area on an aspen leaf, 7/9/68; J.H.F.

**Nematus hypoxanthus* (Forst.) (63) Denaby Ings, 29/5/68; J.H.F.

ACULEATA

Myrmosa atra Pz. (64) Hetchell Wood, 31/8/68; J.H.F.

**Trypoxylon attenuatum* Smith (63) Wadworth Wood, 22/7/65; P.S.

**Passaleucus monilicornis* Dahl. (63) Bretton Park, 6/7/68; J.H.F.

†**Ectemnius cephalotes* (Ol.) (63) Rossington Bridge, 15/7/65; P.S. (64*) Copgrove Park, 14/7/67; P.S.

***E. cavifrons* (Thoms.) (63) Old Denaby, ex *Salix alba*, 19/7/65; C. Devlin. Denaby Ings, ex *Salix fragilis*, 6/68; P.S. (64) Barwick-in-Elmet, 21/7/68; R.H.

E. lapidarius (Pz.) (64) Deep Gill, Hawnby, 16/6/68; R.C.

**E. continuus* (F.) (63) Potteric Carr, 12/8/65; P.S.

**Crossocerus pubescens* (Schuck.) (62) Strensall Common, 9/6/68; J.H.F.

†*C. confusus* (Schulz.) (63) Bretton Park, 6/7/68; J.H.F.

**Lindenius albilabris* (F.) (64) Adel Moor, Leeds, 8/9/68; J.H.F.

Diptera (P. Skidmore): It is most gratifying to be able to report an increase in the number of collectors in the field of flies in Yorkshire during the past year. In fact an unprecedented number have shown an interest in this much-neglected Order for, while the writer has had little time for entomological work during the past season, he has received records from Mr. M. T. Brooke, Mr. R. Crossley, Mr. J. H. Flint, Mr. R. Harris, Mr. L. N. Kidd and Dr. S. L. Sutton. Mr. Kidd's work on the Yorkshire Mycetophilidae has greatly boosted this year's report and we are much indebted to him for his work on this little-known, but very large family. He, together with several others, has submitted great numbers of other records which are being transferred straight on to the lists of Yorkshire Diptera. It was felt that since so many records were received only those which were new to the county or a vice-county should be published here.

Most habitat types have been worked during the past season, but as in other groups it is the marsh and fenland habitats which are providing the most interesting discoveries. The Dearne marshes again hit the headlines with the discovery of an insect association at Denaby Ings which is well known in south-eastern England but was unknown north of Cambridgeshire. This concerns the fly *Macronychia ungulans* which develops in the workings of the Sphecid wasp *Ectemnius cavifrons*, itself a fen or marshland insect. We await with great interest the discovery of further fine fenland specialities in Yorkshire.

The woodland fauna has not been ignored and two noteworthy additions to the Yorkshire list which belong to the sylvan community are the Asilid *Dioctria linearis* and the Oncodid *Oncodes pallipes*.

A discrepancy has come to light regarding certain species recorded as new in last year's report. *Anthomyza bifasciata* and *Amaurosoma flavipes* were erroneously stated to be new to the county when in fact they were only new to a vice-county (V.C. 63). Both had been taken in V.C. 61 by Mr. K. G. Payne but the records had been omitted from the cards. In the present report 29 species are additions to the county list and 45 are new to a vice-county.

TIPULIDAE

**Nephrotoma flavipalpis* (Mg.) (63) Greenfield, 1/7/58, in house; also in 1968; L.N.K.
**N. flavescens* (L.) (63) Greenfield, 7/49; 7/59; 6/66 and 7/67; L.N.K.
**N. analis* (Schumm.) (63) Greenfield, in house, 2/6/59; L.N.K.
**Ormosia hederae* (Curtis) (63) Greenfield, in house, 12/5/67; L.N.K.

ANISOPODIDAE

†*Anisopus zetterstedtii* Edwards (63) Potteric Carr, 1♂ 24/5/68; P.S.

MYCETOPHILIDAE

†*Symmerus annulatus* (Mg.) (64) Bolton Woods, 1♂ 13/6/36; J. Wood (det. L.N.K.).
**Macrocera stigma* Curtis (63) Keighley, 1♂ 7/7/39; J. Wood (det. L.N.K.); High Moor near Scouthead, 1♂ 14/6/52; L.N.K.
**M. stigmoides* Edwards (63) Haw Park, 1♂ 7/9/68; L.N.K.
**Urytalpa ochracea* (Mg.) (63) Greenfield, 1♂ in garden on window, 16/6/67, and on garage window, 15/6/68; L.N.K.
†*Mycomya duplicata* Edwards (63) Haw Park, 1♂ 7/9/68; L.N.K.
†*M. fimbriata* (Mg.) (64) Malham Tarn, 1♂ 17/7/55; A. Brindle (det. L.N.K.). This species of course is new to the Malham List.
†*M. vittiventris* (Zett.) (64) Whitewell, several pairs, 6/7/54; A. Brindle (det. L.N.K.). The only other locality for this striking species appears to be Nethy Bridge (Inverness-shire).
**Sciophila hirta* Mg. (63) Greenfield, 27/6/61 and 7/8/62; L.N.K.
**Speolepta leptogaster* (Winnertz) (63) Greenfield; taken indoors on 11/5/58, 17/5/58, 6/5/59 and 18/4/61; L.N.K. (Kidd, 1962, *Entomologist*, p. 120).
**Boletina gripha* Dziedzicki (63) Haw Park, 2♂ 7/9/68; L.N.K.
**Leia winthemi* Lehm. (63) Greenfield, 1♂ 21/8/67, indoors on garage window; L.N.K.
†*Meunieria hirta* (Winnertz) (63) Greenfield, single ♂♂ indoors on windows on 21/6/66 and 31/7/68; L.N.K.
**Docosia gilvipes* (Walker) (63) Yeoman Hey Plantation, Greenfield, 26/7/61; L.N.K.
†*Exechia dorsalis* (Steager) (63) Haw Park, 2♂ 7/9/68; L.N.K.
†*E. separata* Lundbeck (63) Haw Park, 1♂ 7/9/68; L.N.K.
†*E. nigroscutellata* Landrock (63) Yeoman Hey Plantation, Greenfield, 1♂ 26/8/61; Haw Park, 1♂ 7/9/68; L.N.K.
**Rhymosia fasciata* (Mg.) (63) Greenfield, several during September and October 1961 and 1962; L.N.K. (62) Robin Hood's Bay, 17/5/60; A. Brindle (det. L.N.K.).
**Allodia sericoma* (Mg.) (63) Haw Park, 1♂ 7/9/68; L.N.K.
†*Cordyla fasciata* Mg. (63) Yeoman Hey Plantation, Greenfield, 10/9/60; 26/8/61; Haw Park, 1♂ 7/9/68; L.N.K.
†*Trichonta terminalis* Walker (63) Greenfield, 2♂ 28–30/5/68, both on garage window; L.N.K.
**Phronia annulata* Winnertz (63) Greenfield, 1♂ 9/7/67, indoors on garage window; L.N.K.
**Phronia dubia* Dziedzicki (63) Greenfield, 1♂ 30/5/68, indoors on garage window; L.N.K.

**Mycetophila lineola* Mg. (63) Holme House Wood, Keighley, 1♂ 25/10/36; J. Wood (det. L.N.K.); Yeoman Hey Plantation, Greenfield, 10/9/60; Haw Park, 2♂ 7/9/68; L.N.K.

**M. luctuosa* Mg. (63) St. Ives, near Bingley, 1♂ 3/11/45 and Holme House Wood near Keighley, 25/10/34; J. Wood (det. L.N.K.); Yeoman Hey Plantation near Greenfield, 10/9/60; Haw Park, 2♂ 7/9/68; L.N.K.

†*M. trinotata* Staeger (63) Greenfield, 7/7/62, on window; L.N.K.

STRATIOMYIDAE

†*Geosargus nitidus* (Mg.) (63) Greenfield, 23/6/59; L.N.K. This agrees with the description in Verrall (*British Flies*, Vol. 5, p. 180), but, as he states, it is a very unsatisfactory species.

ASILIDAE

†*Dioctria linearis* (F.) (63) Pot Riding Wood near Cadeby, 6/7/68; P.S. This locality has been variously referred to in the Reports in *The Naturalist*, as Cadeby Wood and Sprotborough Wood; the correct name though, according to early editions of the Ordnance Survey Maps, is Pot Riding Wood. The *D. linearis* here recorded was a male but in July 1967 a further specimen was seen in the same locality. This is the northernmost known station in Britain for this species, a denizen of old oak forest areas of south eastern and central parts of England.

ONCODIDAE

†*Oncodes pallipes* Latr. (62) Ellerburn Bank, Thornton Dale, 14/7/68; Mrs. H. E. Flint (det. J.H.F.).

EMPIDIDAE

†*Empis* (*Xanthemiis*) *concolor* Verrall (63) Pot Riding Wood near Cadeby, 6/7/68, numerous on *Heracleum* flowers; P.S.

**E.* (*X*). *scutellata* Curtis (63) 1♂ Wilthorpe Marsh near Barnsley, P.S.

**Rhamphomyia flava* (Fallen) (63) Roche Abbey, 1♂ 15/9/65; P.S.

**R. anomalipennis* Mg. (63) 1♂1♀ Greenfield, on garage window, 1/6/68; L.N.K. Only one previous record for Yorkshire, from Pateley Bridge (C. A. Cheetham).

**Leptopeza flavipes* Mg. (63) 1♀ Pot Riding Wood, Cadeby, 19/6/66; P.S.

**Clinocera fontinalis* (Haliday) (63) Slackcotes, 2/9/65; L.N.K. One old record for county from Worton (J. H. Audcent; *Naturalist*, 1910).

DOLICHOPODIDAE

**Dolichopus claviger* Stannius (63) 1♂ Hatfield Moors, 11/7/65; T. M. Clegg (det. P.S.); 1♂ Roche Abbey 8/7/65; P.S.

**Porphyrops crassipes* Mg. (63) 2♂ Denaby Ings, 2/6/68; P.S.; Greenfield, 8/6/68; L.N.K.

**Syntormon tarsatus* (Fallen) (63) 1♂, several seen, Hingcliff Hill near Langsett, 13/7/68; P.S.

†*Argyra perplexa* Beck (63) 1♂ Greenfield, on windows indoors, 31/8/68; L.N.K.

†*Machaerium maritimae* Haliday (61) 1♂ Kilnsea Warren, 22/7/65; T. M. Clegg (det. P.S.).

**Hydrophorus nebulosus* Fallen (63) Upperwood near Greenfield, numerous in *Callunetum*, 9/5/53; P.S.; L.N.K., and 27/8/54; L.N.K.

CLYTHIIDAE

†*Opetia nigra* Mg. (63) 1♂ Denaby Ings, 11/5/68; P.S.

PIPUNCULIDAE

**Verrallia setosa* Verr. (63), 1♀ Pot Riding Wood, Cadeby, 3/6/66; P.S.

PHORIDAE

†*Aneurina thoracica* (Mg.) (63) One in Yeoman Hey Plantation, Greenfield, 10/9/60; L.N.K.

SYRPHIDAE

**Pyrophaena rosarum* F. (62) 1♂ Deep Gill, Hawnby, 16/6/68; R.C.

**Melanostoma ambiguum* Fallen (63) Numerous at Wilthorpe Marsh on 28/4 and 5/5/68; R.C.

†*Syrphus latilunulatus* Collin (64) Barwick-in-Elmet; one taken during 1968 by R. Harris.

†*Neoascia aenea* Mg. (63) 1♂1♀ Wilthorpe Marsh, 18/5/68; R.C.

†*Pipiza luteitarsis* Zett. (63) Several at Cantley, 24/5/67; R.C., P.S.; 1♂ Little Smeaton, 30/5/67; P.S.

**Pipizella virens* F. (63) Sparingly at Blaxton Common on 16/6/68; P.S. Specimens recorded under this name from Allerthorpe and Austwick may really refer to *P. varipes*, the common *Pipizella* in northern England which curiously has not yet been recorded from Yorkshire. According to Coe (*R.E.S. Handbook*, Vol. x, pt. 1, p. 58) *P. virens* is an uncommon species only known south of Norfolk.

**Chilosia albipila* Mg. (63) Several males at Wilthorpe Marsh near Barnsley 28/4/68; R.C.

**Eristalis abusivus* Collin (61) 1♂ Spurn, August 1968; J. Cudworth (det. R.C).

CONOPIDAE

**Conops quadrifasciata* De Geer (64) Barwick-in-Elmet, one taken during 1968› R. Harris.

PSILIDAE

**Chyliza annulipes* Macq. (63) 1♂ Sandall Beat Wood, Doncaster, 29/5/68; P.S. One previous record for Yorkshire, from Pickering (C. A. Cheetham).

**Psila nigra* (Fallen) (61) 1♂ taken, many others seen, Skipwith Common, 11/6/68; P.S.

SCIOMYZIDAE

**Renocera pallida* (Fallen) (61) Several at Skipwith Common, 11/6/68; P.S.

†**Tetanocera arrogans* Mg. (63) Wilthorpe Marsh, 2/7/67 and Denaby Ings, 26/8/67; P.S. (61*) Pocklington, 20/7/68; R.C. (det. P.S.).

†*Sepedon spinipes* Scopoli (63) 1♂ Sprotborough Flash, 2/6/68; P.S.

OPOMYZIDAE

†*Geomyza apicalis* (Mg.) (64) Sparingly on the limestone pavement on north-east slope of Ingleborough in June 1955; P.S. An extremely little-known British species which is readily separated from other members of the genus by the very narrow short wings.

EPHYDRIDAE

†*Caenia fumosa* Mg. (63) 2 specimens taken, others seen, at Denaby Ings, 26/8/67; P.S.

SPHAEROCERIDAE

†*Limosina rufilabris* Stenh. (63) 1♂ swept from *Eriophorum* on Hingcliff Hill, near Langsett, 13/7/68; P.S.

DIASTATIDAE

**Diastata nebulosa* (Fallen) (63) Numerous in *Eriophorum* bog on Hingcliff Hill near Langsett, 13/7/68; P.S.

SCATOPHAGIDAE

**Cordilura pudica* Mg. (61) Several at Skipwith Common, 4/7/67; P.S.

**Amaurosoma armillatum* Zett. (61) Numerous at Skipwith Common, 25/5/68; P.S.

***Chaetosa punctipes* Mg. (61) Skipwith Common, numerous on 25/5/68; P.S. (63) abundant at Potteric Carr and Blaxton Common on 24/5 abd 16/6/68; P.S.

TACHINIDAE

**Servillia ursina* Mg. (62) Strensall Common, one on 5/4/68; J.H.F.

CALLIPHORIDAE

**Metopia campestris* Fallen (64) One taken at Barwick-in-Elmet during 1968; R. Harris.

†*Macronychia ungulans* (Pandelle) (63) 1♀ reared from puparium found in workings of the Sphecid wasp *Ectemnius* (*Clytochrysus*) *cavifrons* in an old Crack Willow branch at Denaby Ings on 23/6/68; P.S. According to van Emden (*Roy. Ent. Soc. Handbook*, Vol. x, pt. 4a, p. 107), this fly is only known from Cambridge southwards where it occurs with the species of wasp mentioned.

ANTHOMYIDAE

**Acroptena divisa* (Mg.) (63) Abundant amongst *Carex riparia* on Potteric Carr on 24/5/68; P.S. Only previous Yorkshire record from Bedale (C. A. Cheetham).

Lepidoptera (S. M. Jackson): Considering the mixed weather the past year has been a fairly good one and considerably better than 1967, especially for the butterflies. Among the moths, three species (†) have been added to the county list; quite an achievement! My thanks are again due to the following contributors for their lists of records, from which I have selected the more important: J. Armitage, J. Briggs, W. E. Collinson, J. H. Flint, R. Harris, C. R. Haxby, A. M. R. Heron, E. Richards, C. I. Rutherford, C. C. Smith, Dr. S. L. Sutton, P. G. Tannett, M. Taylor and P. Winter.

RHOPALOCERA

Colias croceus Fourc. (Clouded Yellow) (64) Barwick-in-Elmet, one on 24/7/68; R.H.

Argynnis euphrosyne L. (Pearl-bordered Fritillary) (62) Newton Dale, 5/68; E.R., P.W. Also at Raindale, in same area, 27/5/68; P.W.

Aglais urticae L. (Small Tortoiseshell) Commoner than usual and continuing until late October in all areas; S.M.J.

Nymphalis io L. (Peacock) In contrast to 1967, 1968 has been an exceptionally good one for this species. Apart from the industrial areas it has been reported commonly by several contributors from most parts of the county and I have never before seen it in such numbers in the Selby district; S.M.J.

Vanessa cardui L. (Painted Lady) A few scattered records only have been received from inland areas but it was reported fairly widely in north-east coastal districts; P.W.

V. atalanta L. (Red Admiral) Though still not an outstanding year for this insect, 1968 has been much better than last year. Like *urticae* it has tended to appear later in the season and very many records have been received from all parts of the county. In gardens in the centre of Leeds it was visiting *Dahlia* flowers commonly up to 12/10.

Melanargia galathea L. (Marbled White) (61) Burdale, several seen just emerging on 21/7/68; S.M.J. A new colony discovered at Warrendale, 7/68; M.T.

Eumenis semele L. (Grayling) (61) Kiplingcotes Quarry, several noted on 10/8/68; S.M.J.

Maniola tithonus L. (Gatekeeper) (61) Market Weighton, just emerging on dyke sides on 27/7/68 and in numbers there on 10/8/68; S.M.J. (63) Noted again at Thorne, 1/8/68; A.M.R.H.

Aphantopus hyperanthus L. (Ringlet) (61) Exceptionally abundant in the Wolds valleys about Thixendale and Burdale, 21/7/68; also at Market Weighton and Kiplingcotes, 27/7/68; S.M.J.

HETEROCERA

Smerinthus ocellata L. (Eyed Hawk) (64) Scholes near Leeds, two in 6/68; S.L.S. Unlike the Poplar Hawk which is distributed throughout the county, the Eyed Hawk is rarely seen in the industrial south-west but is moderately common further east, particularly in the Plain of York.

Acherontia atropos L. (Death's Head Hawk) (63) One live specimen given to the Doncaster Museum on 30/8/68; it had been found in the town, but the finder's name was not given.

Herse convolvuli L. (Convolvulus Hawk) (63) Two specimens were handed in at the Doncaster Museum and Art Gallery on 15/8 and 25/9/68; the former from Intake, found by Master D. Roberts, the latter from Bessacarr found by Mr.

Eggison. Both examples were alive and in immaculate condition and one ejected a drop of pupal fluid when handled (P. Skidmore).

Macroglossum stellatarum L. (Humming-bird Hawk) (61) Spurn, one on 18/7/68; S.L.S.

Drymonia ruficornis Hufn. (Lunar Marbled Brown) (64) Bishop Wood, 24/4/68; C.C.S. Not very common in Yorkshire.

Pheosia gnoma F. (Lesser Swallow Prominent) (61) An unusually late occurrence of this fairly common moth was at Barlby on 18/10/68; S.M.J.

†*Odontosia carmelita* Esp. (Scarce Prominent) (62) Ampleforth, one taken on 5/5/68; S.L.S. This species is not uncommon in the Furness district of North Lancashire and in North Nottinghamshire and although there are many apparently favourable sites in Yorkshire for this insect this is the first time that it has been recorded in the county.

Orgyia antiqua L. (Vapourer) (62) Pilmoor, one larva on 20/8/68; S.L.S. (63) Whitley Bridge, a larva taken on 8/9/68 did not produce a moth until October, a very late date; S.M.J. Larvae reached almost plague numbers along a Hawthorn hedge on Doncaster Racecourse in August 1968 (P. Skidmore). Appears to be scarcer than formerly; S.M.J.

Leucoma salicis L. (White Satin) (61) Driffield, one on 28/7/68; P.W. A rare species now in Yorkshire.

Eilema lurideola Zinck. (Common Footman) (61) Larvae common at Spurn; S.L.S.

Colocasia coryli L. (Nut Tree Tussock) (64) One taken at Barwick-in-Elmet near Leeds; R.H. Not recorded from this part of the county for very many years, the only recent reports of this insect having been from the Grassington and Pickering districts where it has occurred at light.

Apatele alni L. (Alder moth) (64) Scholes near Leeds, two on 16/6/68; S.L.S.

Craniophora ligustri F. (Coronet) (61) One near Driffield; P.W. A new locality for this very local species.

Ammogrotis lucernea L. (Northern Rustic) (63) Birkenshaw near Bradford, one on 28/7/68; (W. Jagger); J.B. Also at Halifax; W.E.C.

Spaelotis ravida Hübn. (Stout Dart) (61) Spurn, two on 22/8/68; S.L.S.

Eurois occulta L. (Great Brocade) (63) Birkenshaw, one in 8/68; (W. Jagger); J.B. Apparently little movement of this migrant species during 1968 as this is the only record I have received.

Hadena trifolii Rott. (Small Nutmeg) (64) Scholes near Leeds, several in 8/68; S.L.S. Used to be fairly common, but rarely reported in recent years.

H. nana Hufn. (Light Shears) (64) One at Scholes; S.L.S. Though fairly common in the Malham and Grassington areas, this appears to be generally less widespread than formerly.

Dryobotodes protea Schiff. (Brindled Green) (64) Bramham, 29/8/68; J.H.F.

Apamea ophiogramma Esp. (Double Lobed) (61) Barlby, one on 29/7/68; S.M.J. (64) Scholes, one on 13/8/68; S.L.S.

A. scolopacina Esp. (Slender Brindle) (62) Pilmoor, one on 12/8/68; S.L.S. Not previously known from this district.

Brachionycha sphinx Hufn. (Sprawler) (61) Raincliffe Woods, adult on 31/10/68; P.W. (64) Wetherby, larva beaten from elm on 4/6/68; S.M.J. Whilst the status of many insects has changed over the years, the continued scarcity in Yorkshire of this moth is surprising as it occurs sometimes commonly in neighbouring counties. The very few records I have are all of single captures.

Celaena leucostigma Hubn. (Brown Crescent) (64) Scholes, 24/7/68; S.L.S.

†*Arenostola fluxa* Hübn. (Mere Wainscot) (62) The first known Yorkshire specimen was taken in a locality north of York on 12/8/68, and a second, by the same captor, at Aberford (64) on 4/9/68; S.L.S. The second record is a very late date for this moth but many species have been late this year. It is interesting to speculate why this insect has not previously been taken in the county as there has been no lack of activity by members working suitable habitats. The occurrence of the two initial specimens in widely separated places is very curious; does it indicate recent colonisation, or that the species is a very local relict?

Amphipyra pyramidea L. (Copper Underwing) (63) Triangle, near Halifax; one taken on 9/9/68 was only the second for that district; W.E.C. (see *Naturalist*, 1965, p. 22).

Zenobia subtusa F. (Olive Kidney) (64) Scholes, one on 30/8/68; S.L.S. Not often reported.

Omphalosceles lunosa Haw. (Lunar Underwing) (64) Scholes, common on 6/9/68; S.L.S.

†*Heliothis dipsacea* L. (Marbled Clover) (61) Muston near Filey, one at Ragwort bloom on 14/8/68; P.W. Porritt's guarded reference to this species having reputedly occurred in the county last century indicates his doubt regarding its authenticity. The present record however is well authenticated and I am regarding it as a new county record.

Iodis lactearis L. (Little Emerald) (61) Cliffe Common, a few during 8/68; S.M.J.

Scopula ternata Schrank (Smoky Wave) (61) Levisham, 15/6/68; S.M.J. (64) Washburndale, common on high ground on 16/6/68; C.C.S.

Nophopteryx carpinata Borkh. (Early Tooth-striped) (64) Askham Bog, 17/4/68; C.C.S.

Lobophora halterata Hufn. (Seraphim) (62) Strensall, 9/6/68; J.H.F. A very local species. (See *Naturalist*, 1966, p. 21.)

Lygris pruinata L. (Large Phoenix) (62) Ampleforth, 24/8/68; S.L.S. (63) Triangle near Halifax; W.E.C.

Thera juniperata L. (Juniper Carpet) (64) Harrogate, one on 15/10/68, and one on 22/10/68; Dr. Faulkner, per C.I.R. First record since Porritt; the moths may have been introduced with the foodplant from elsewhere, or it may be established on some allied garden shrub growing nearby. The two captures — a week apart — makes it more likely that they bred locally.

Xanthorhoe munitata Hubn. (Red Carpet) (64) 35 recorded in trap set up at Malham Tarn Field centre; J.B.

Colostygia multistrigaria Haw. (Mottled Grey) (64) Breary Marsh near Leeds, abundant on 30/3/68; C.C.S. A locally common insect.

Euchoeca nebulata (Scop) (Dingy Shell) (64) Bishop Wood 2/6/68; C.C.S. Also a few noted in another area near Selby in 6/68; S.M.J.

Perizoma flavofasciata Thunb. (Sandy Carpet) (64) Malham Tarn Field centre, 12–18/6/68; J.B. Not as common as one would expect, but now rather local.

P. bifasciata Haw. (Barred Rivulet) (61) Skipwith Common, 19/7/68; C.C.S. An interesting addition to my Skipwith list; the foodplant, Red Bartsia (*Odontites verna*), grows locally on the Common.

Gymnoscelis pumilata Hübn. (Double-striped Pug) (64) Malham Tarn Field centre, 7/68; J.B. Now very rare in Yorkshire, there being only one other recent record.

Ennomos quercinaria Hufn. (August Thorn) (61) Muston near Filey, 4/9/68; P.W. The only other recent records of this very local moth are from Pickering.

Apocheima hispidaria F. (Small Brindled Beauty) (64) Bishop Wood, again noted high up on Sycamore trunks on 26/3/68; J.B.

Cataclysta lemnata L. (64) Scholes, 13/8/68; S.L.S.

Euxanthis zoegana L. (61) Thrixendale, 21/7/68; S.M.J.

Notocelia uddmanniana L. (64) Selby, 31/7/68; S.M.J.

Eucosma foenella L. (61) Barlby, 21/7/68; S.M.J.

Ypsolophus parenthesellus L. (61) Scarborough, 11/8/68; S.M.J.

BOTANY

(Dorothy R. Walker): The winter of 1967–8 was an average one with not too much snow and frost. Spring growth started early but, as so often happens, cold north winds followed with consequent slowing down of progress.

From the Thirsk area icy winds are said to have restricted early growth. Flowering generally was late though good and fruiting was also good, but farm crops suffered severely from the storm of 2nd July.

Around Richmond, after promise of an early spring, cold weather retarded growth and spring flowering was late. Rowan, sloe, pear and apple flowered well and all set fruit but high winds in summer spoilt the apple crop. There has been damage by floods and our reporter says she has never before seen the Swale and Tees in spate so often in summer. Grass, hay and silage crops have all been good; hollies in the area have an excellent crop of berries and hazels plenty of nuts.

From upper Wharfedale our reporter comments on people's varied reactions to this summer; mostly they say good — even wonderful — which means they have had little rain. But on the whole they have lacked sunshine since the three fine weeks of June. The deluge of 2nd July was not accompanied by hail in upper Wharfedale and there were no corn crops to suffer, whilst much of the hay was already in. Limes in Linton flowered at the end of June but set hardly any fruit. They flowered again profusely in the first week of August and have since set fruit.

At Ilkley the northerly winds made for a late start to flowering but the sunshine from the end of May to the third week of June made amends. There was a fine show of buttercups as they were unspoilt by rain. Most trees and shrubs flowered and fruited well. Elms in particular were full of fruits on 15th June and an exceptional profusion of elm fruits was reported from other parts of the county. During the thunderstorm of 2nd July a large ash tree by the road between Bolton Abbey and Barden was struck by lightning and pieces of bark were flung across the road and about fifteen yards into a field.

The Harrogate area suffered severely from the hail and rain storm of 2nd July. In a few minutes trees had their leaves shredded and some branches broken off; roses which were just coming into flower were stripped to bare and sometimes broken stems and herbaceous plants were pulverised. Many farmers had cornfields smashed and potato crops spoiled.

The Halifax area escaped the worst of the storm though a short distance away in the Elland and Brighouse areas much damage was done to trees, shrubs and other plants and here and in the Huddersfield district destruction of greenhouse crops through glass breakage was widespread. As at Ilkley, our reporter comments on an exceptionally fine display of buttercups in the Halifax district, the like of which he had never before seen. Oaks there have been noteworthy not only for their good crops of flower and fruit but for their unusual freedom from damage by the larvae of the Green Oak Moth (*Tortrix*). Lammas shoots were also vigorous. Trees generally, in the Halifax area, fruited well and bilberries bore a heavy crop with pickers more in evidence than for many years.

Apart from the three sunny weeks of June, the summer of 1968 will be remembered as a wet one. Over most of the county for most of the time it was either wet or dull and chilly with odd summer's days sandwiched in between grey or wet ones.

Plant Records: East Riding (E. Crackles)

Two notable discoveries have been made in 1968: *Eleocharis uniglumis* occurs in two marshes between Wansford and Driffield, this being the first time the species has been recorded in the vice-county; and *Oenanthe fluviatilis* occurs in abundance along considerable stretches of the River Hull and not only in the two previously recorded localities along the river. Excursions to the Kirkham Abbey area early in the year, of the Bryological Section of the Y.N.U. and of the York and District Field Naturalists' Society resulted in the confirmation of old records for *Lathraea squamaria*, *Adoxa moschatellina* and *Cardamine amara*. Additional records for a large number of species which are rare or very local in East Yorkshire have been made this year and there has been a pleasing increase in the number of contributors. The inclusion of a grid-square reference indicates an addition to the distribution as recorded in the *Atlas*.

Polystichum aculeatum (L.) Roth. Kirkham Abbey woods 44/76; Mrs. F. Houseman (F.M.).

Ophioglossum vulgatum L. In chalk quarry, near Goodmanham 44/94; Miss P. Gardam: Wheldrake Ings; T. C. E. Wells: Cattleholmes, near Wansford; Miss E. Crackles (E.C.).

Clematis vitalba L. Old drove road, Elloughton; E.C.

Ranunculus sardous Crantz Near Cottingham; D. Shimwell.

Ranunculus parviflorus L. Reighton Cliffs; E.C.

Fumaria parviflora Lam. Fordon; E.C.

Cardamine amara L. Kirkham; E.C. Confirmation of old record.

Myosoton aquaticum (L.) Moench Near Melbourne; Y.N.U. Excursion.

Stellaria palustris Retz. Kelleythorpe 54/05, the only recent record for the River Hull valley; E.C.: near Melbourne; Y.N.U. Excursion.

Sagina nodosa (L.) Fenzl Wintringham 44/87; T. C. E. Wells.

Montia fontana L. ssp. *chondrosperma* (Fenzl) Walters Figham Common, Beverley; Beverley Naturalists comm. M. Taylor (M.T.), det. M. Walters.

Linum anglicum Mill. Near Thixendale; M.T.

Geranium sanguineum L. Near Londesborough 44/84; E. Wear.

Geranium columbinum L. Fordon 54/07; E.C.
Astragalus danicus Retz. Fordon 54/07; E.C.
Onobrychis viciifolia Scop. Fordon 54/07; E.C.
Saxifraga tridactylites L. Burdale; M.T.
Oenanthe fluviatilis (Bab.) Colem. In the River Hull, almost continuously from Hempholme Lock to Surf Dike 54/04 and 54/05, also for a considerable stretch above and below Corps Landing and at Bell Mills; E.C.
Primula veris x *vulgaris* = *P. variabilis* Goupil, non Bast. Kirkham; York Nats. Excursion: Wansford; E.C.
Samolus valerandi L. Leven Canal 54/04; E.C.
Blackstonia perfoliata (L.) Huds. Eppleworth; D. Shimwell.
Myosotis sylvatica Hoffm. Bell Mills, Driffield; E.C.
Hyoscyamus niger L. Paull; R. Thistleton.
Lathraea squamaria L. Kirkham Abbey woods; F.H. and E.C. Confirmation of old record.
Pinguicula vulgaris L. Wintringham and Settrington, 44/87; E.C.
Legousia hybrida (L.) Delarb. Near Thorpe Bassett; E.C.
Galium mollugo x *G. verum* = *G.* x *pomeranicum* Retz. Near Wintringham, 44/87; E. Chicken.
Galium uliginosum L. Elmswell; E.C.
Adoxa moschatellina L. Kirkham Abbey woods; E.C. Confirmation of old record.
Paris quadrifolia L. Kirkham Abbey woods; F.H.
Gymnadenia conopsea (L.) R.Br. Fordon; E.C.
Orchis morio L. Near Nafferton; M.T. Between Beeford and Brandesburton; A. Washington, comm. M.T.
Orchis mascula (L.) L. Near North Newbald; E. Wear.
Dactylorhiza incarnata (L.) Vermeul. ssp. *pulchella* (Druce) H.-Harrison f. Kelleythorpe; E.C.
Lemna gibba L. Near Melbourne; Y.N.U. Excursion.
**Eleocharis uniglumis* (Link) Schult. (det. M. Walters) Two localities between Wansford and Driffield, 54/05; E.C. New to East Yorkshire.
Carex hostiana DC. Kings Mill and North Newbald; E.C.
Carex hostiana x *C. lepidocarpa* = *C.* x *fulva* Gooden. Kings Mill, 54/05; E.C.
Carex vesicaria L. Near Melbourne, 44/74; Y.N.U. Excursion.
Carex acuta L. Near Melbourne; Y.N.U. Excursion.
Carex echinata Murr. Near Wintringham, 44/87; E.C.
Sieglingia decumbens (L.) Bernh. Kings Mill, Driffield, 54/05 and Wintringham, 44/87; T. C. E. Wells and E.C.
Poa compressa L. Near Rotsea, 54/05 and at Elmswell, 44/95; E.C.
Glyceria declinata Bréb. Near Wintringham, 44/87; T. F. Medd.
Melica uniflora Retz. Near Haltemprice Priory, Cottingham; D. Shimwell.

WEST RIDING: (F. Murgatroyd)

Additional grid-square records for many widely distributed species make up the bulk of the records listed below. I have to thank Miss Lefevre and Mr. Skidmore for supplying most of these, from the Grassington and Doncaster areas respectively.

Osmunda regalis L. (63) Byram Park; R. F. Dickens. Probably introduced.
Blechnum spicant (L.) Roth (64) Round Hill, 44/96; H. Lefevre (H.L.).
Asplenium trichomanes L. (63) Wall at Old Haugh End, Sowerby, 44/12; F.M.
Ceterach officinarum DC. (64) On a wall at Hollins, Hampsthwaite, and on a wall at Birstwith, both in 44/25; C. Webb. New to Nidderdale.
Ranunculus lenormandii F. W. Schultz (64) Buckden Pike, 44/97, and Gate Up, Grimwith, 44/06; H.L.
Cardamine amara L. (64) Linton in Craven, by beck 44/96; H.L.
Silene vulgaris (Moench) Garcke (64) Railway at Linton in Craven, 44/96; H.L.
Stellaria graminea L. (64) Cockerham; Linton Moor Lane; Threshfield Beck, all 44/96; H.L.
Myosoton aquaticum (L.) Moench (63) Garden weed at Holmfield, Halifax, 44/02; F.M.
Lotus uliginosus Schkuhr (64) Cockerham, 44/96; Stickhaw, 44/06; H.L.
Trifolium medium L. (64) Linton Moor Lane, 44/96; H.L.
Lathyrus pratensis L. (64) Railway, Linton in Craven, 44/96; H.L.

Peplis portula L. (63) Blaxton Common, 44/60; Miss M. Shaw.
Epilobium adenocaulon Hausskn. (63) Crow Wood, 43/96; Miss M. Shaw.
Hydrocotyle vulgaris L. (64) Round Hill, 44/96; H.L.
Silaum silaus (L.) Schinz & Thell. (64) Hymans quarry, Low Bridge, Knaresborough; Mrs. F. Houseman.
Chaenorhinum minus (L.) Lange (63) Railway track, Denholme, 44/03; C. Hartley. (64) Railway, Linton in Craven, 44/96; H.L.
Euphrasia confusa Pugsl. (64) Roadside, Hanging Moor near Thruscross, and Duck Street quarries, Greenhow, both in 44/16; Mrs. F. Houseman.
Stachys palustris x *sylvatica* = *S. ambigua* Sm. (63) Stocksmoor, 44/21; Y.N.U. Exc.
Veronica scutellata L. (63) Stocksmoor; Y.N.U. Exc.
Hieracium decolor (W. R. Linton) A. Ley (64) Dib Scar, Conistone, 44/96; F. Houseman. This appears to be new to county.
Tamus communis L. (64) Round Hill, 44/96; H.L.
Orchis morio L. (64) Upper Dunsforth, 44/45; Mrs. D. Haythornthwaite.
Acorus calamus L. (64) Great Ouseburn, 44/46; Mrs. D. Haythornthwaite.
Eleocharis acicularis (L.) Roem. & Schult. (63) Blaxton gravel pits, 44/60; P. Skidmore.
Catabrosa aquatica (L.) Beauv. (63) Potteric Carr, 43/59; P. Skidmore.
Calamagrostis canescens (Weber) Roth (63) Sandall Beat Wood, Potteric Carr, Beeston Plantation, Bessacarr Carr, all in 43/59; P. Skidmore. Long known from the Potteric Carr area but omitted from the *Atlas*.
Alopecurus aequalis Sobol. (63) Blaxton gravel pits, 44/60; Miss M. Shaw 1966; P. Skidmore 1968.

NORTH RIDING: (C. M. Rob)

The number of records for the North Riding is well above average but most of these are for common plants which had been missed when the field work for the *Atlas* was in progress. All records listed below with grid square references are additions to the *Atlas*; these will be useful for the second edition of that work. Of the more interesting records, that of *Orobanche alba* from the Yoredale scars near Carperby in Wensleydale, is outstanding. The plant was first recorded from Wensleydale more than 100 years ago, but has not been seen for over 40 years. This year Dr. J. D. Lovis discovered a good colony on a steep slope below the main scars. A number of other likely-looking places were subsequently examined, with no success.

Cryptogramma crispa and *Myosotis brevifolia* have both been recorded from the Cotterdale – Great Shunner Fell square and are sufficiently rare to warrant inclusion in this report. *Chaenorhinum minus* is well known on railway ballast, but is not often seen in arable fields. There was a fair amount in a field near Snape where both *Stachys arvensis* and *Anthemis cotula* were abundant. The *Anthemis* is very uncommon in the North Riding. *Sagittaria* in the Derwent is an interesting extension of the known range of this plant in Yorkshire. *Carex boenninghausiana* near Helmsley is also a very interesting find and it is very surprising that *Carex pauciflora* should previously have been overlooked in the well-worked area of Fen Bog.

I am grateful to all who have sent records for the report; those of Mr. Medd for the York area and Mr. Simpson for the Forestry plantings have made up the majority of additions to the published 10 km. squares.

Initials of contributors: I. C. Lawrence, T. F. Medd, C. M. Rob, G. A. Shaw, G. Simpson, W. A. Sledge.

Lycopodium clavatum L. (62) Hasty Bank, Great Broughton, 45/50; I.C.L. Disused quarry, Stoupes Brow, Ravenscar, 45/90; G.A.S. Cawthorn Moor, 44/79; G.S. (65) Nutwith Common, Masham, 44/27; Y.N.U.
Selaginella selaginoides (L.) Link (65) Great Shunner Fell, 34/88; W.A.S.
Equisetum sylvaticum L. (62) Baker's Warren, 44/98; G.S.
Equisetum telmateia Ehrh. (62) Deepdale, 44/99; G.S.
Cryptogramma crispa (L.) R.Br. ex Hook. (65) Great Shunner Fell; G.A.S. Simonstone; Miss Lefevre.
Athyrium filix-femina (L.) Roth (62) Ireton Moor, 54/08; G.S.
Dryopteris borreri Newm. (62) Ireton Moor, 54/08; G.S.
Helleborus viridis L. Deepdale, 44/99; G.S.
Ranunculus trichophyllus Chaix (65) Lake at Hornby Castle, 44/29; Y.N.U.
Ranunculus circinatus Sibth. (62) Near Kildale, 45/60; I.C.L.
Draba incana L. (65) Above High Shaw, 34/89 and Nappa Scar, 34/99; W.A.S.

Cardamine amara L. (62) Black Park, 44/79; G.S.
Polygala serpyllifolia Hose (62) Ireton Moor, 54/08; G.S.
Hypericum humifusum L. (62) Cropton, 44/78; G.S.
Arenaria serpyllifolia L. (62) Maw Rigg, 44/99; G.S.
Spergularia rubra (L.) J. & C. Presl (62) Cropton, 44/78; G.S.
Scleranthus annuus L. (62) Warthill, 44/65; T.F.M.
Linum catharticum L. (62) May Beck, 45/80; G.S.
Geranium dissectum L. (62) Cropton, 44/78; G.S.
Ononis repens L. (62) Murton, near Hawnby, 44/58; Y.N.U.
Potentilla palustris (L.) Scop. (62) Warthill Common, 44/65; T.F.M.
Potentilla anglica Laichard (62) Murton, nr. Hawnby, 44/58; Y.N.U.
Epilobium roseum Schreb. (62) Middlesbrough, 45/41; I.C.L.
Hippuris vulgaris L. (65) Hornby Castle, 44/29; Y.N.U.
Oenanthe fistulosa L. (62) Newby in Cleveland, 45/51; I.C.L.
Betula pendula Roth (62) Ness Head, 44/88; G.S.
Salix caprea L. (62) Ireton Moor, 54/08; G.S.
Erica tetralix L. (62) Ireton Moor, 54/08; G.S.
Vaccinium myrtillus L. (62) Ireton Moor, 54/08; G.S.
Menyanthes trifoliata L. (62) May Beck, 45/80; G.S.
Symphytum tuberosum L. (65) Nr. Ellerton on Swale, 44/29; C.M.R.
Myosotis brevifolia C. E. Salmon (65) Cotterdale; C.M.R.
Lithospermum officinale L. (62) Hutton Rudby, 54/40; I.C.L.
Solanum nigrum L. (62) Pickering, 44/88; G.S.
Chaenorhinum minus (L.) Lange (65) Snape, 44/28; C.M.R.
Scrophularia umbrosa Dumort. (65) Hornby Castle, 44/29; Y.N.U.
Digitalis purpurea L. (62) Bickley Moor, 44/99; G.S.
Veronica agrestis L. (65) Snape, 44/28; C.M.R.
Orobanche alba Steph. ex Willd. (65) Scars above Carperby, 34/99; Dr. J. D. Lovis.
Clinopodium vulgare L. (62) Hutton Rudby, 45/40; I.C.L.
Stachys arvensis (L.) L. (62) North Head, 44/99; G.S. (65) Snape, 44/28; Lady Ropner.
Campanula latifolia L. (62) Broxa Bank, 44/99; G.S.
Galium mollugo L. subsp. *erectum* Syme (62) Castle Howard, 44/77; T.F.M.
Galium mollugo x *verum* (*G.* x *pomeranicum* Retz.) (65) Downholme, near Richmond, 44/19; Mrs. J. Holloway.
Galium uliginosum L. (62) Warthill Common, 44/65; T.F.M.
Valeriana officinalis L. (62) Murton, nr. Hawnby, 44/58; Y.N.U.
Knautia arvensis (L.) Coult. (62) May Beck, 45/80; G.S.
Senecio aquaticus Hill (62) Newby in Cleveland, 45/41; I.C.L.
Anthemis cotula L. (65) Snape, 44/28; C.M.R.
Artemisia vulgaris L. (62) Newbridge Quarries, 44/88; G.S.
Hypochoeris radicata L. (62) Ness Head, 44/88; G.S.
Crepis paludosa (L.) Moench (62) Wintergill, 45/70; G.S.
Taraxacum laevigatum (Willd.) DC. (65) Hornby Castle, 44/29; Y.N.U.
Alisma plantago-aquatica L. (62) Sutherland Beck, 44/79; G.S.
Sagittaria sagittifolia L. (62) River Derwent near Charm Park, Wykeham, 44/98; Scarborough Field Nats. comm. Mrs. Lynes.
Potamogeton lucens L. (62) River Derwent, Norton, Malton, 44/77; T.F.M.
Epipactis helleborine (L.) Crantz (63) Flainsey Rigg, 44/88; G.S.
Listera ovata (L.) R.Br. (65) Hornby Castle, 44/29; Y.N.U.
Orchis ustulata L. (62) Gundale, Pickering, 44/88; J. Armitage & A. Norris.
Dactylorchis maculata (L.) Vermeul. (62) Deepdale, Murton, 44/58; Y.N.U. May Beck, 45/80; G.S.
Lemna trisulca L. (65) Hornby Castle, 44/29; Y.N.U.
Carex binervis Sm. (62) Ireton Moor, 54/08; G.S.
Carex lepidocarpa Tausch (65) Hornby Castle, 44/28; Y.N.U. Haw Bank, nr. Carperby, 34/99; C.M.R.
Carex pseudocyperus L. (62) Planted in Castle Howard Park, 44/77; T.F.M.
Carex rostrata Stokes (65) Hornby Castle, 44/29; Y.N.U.
Carex pilulifera L. (62) Ireton Moor, 54/08; G.S.
Carex paniculata x *remota* (*C.* x *boenninghausiana* Weihe) (62) Near River Rye, Duncombe Park, 44/58; Mrs. D. Blair.
Carex spicata Huds. (62) Ruffa Lane, 44/88; G.S.

Carex pauciflora Lightf. (62) Fen Bog, a few plants; C.M.R.
Poa nemoralis L. (62) Wrea Head College, 54/09; G.S. (65) Kirklington, 44/38; C.M.R.
Catabrosa aquatica (L.) Beauv. (62) Duncombe Park, 44/58; Mrs. D. Blair.
Deschampsia flexuosa (L.) Trin. (62) Warthill Common, 44/65; T.F.M.
Agrostis gigantea Roth (65) Kirklington, 44/38; C.M.R.
Holcus mollis L. (62) Ireton Moor, 54/08; G.S.

ALIENS AND CASUALS: (Mrs. F. Houseman)

Several members continue to take a keen interest in aliens and have recorded that some plants have become established and a few persist for a year or two. Present-day methods of tipping are not favourable for much plant growth especially on the wool dumps. Many established aliens may be seen in the wilder parts of the gardens of stately homes and near abbeys.

The following have kindly sent records: Mrs. J. E. Duncan, C. Hartley, Miss R. Kilby, I. C. Lawrence, T. F. Medd, F. Murgatroyd, Dr. G. A. Nelson, J. Oxtoby, Miss C. M. Rob, G. A. Shaw, H. D. Sutcliffe, Miss M. Taylor, J. A. Vaughan.

Rapistrum rugosum (L.) All. (62) Waste land, Middlesbrough; I.C.L.
Coronopus didymus (L.) Smith (64) Building site, Ilkley; J.E.D.
Thlaspi arvense L. (64) Waste ground, Ilkley; J.E.D.
Sisymbrium orientale L. (64) Waste ground, Ilkley; J.E.D.
Malcolmia maritima R. Br. (62) Barley field near Pickering; J.A.V.
Erysimum cheiranthoides L. (64) Riverside, Scarborough Bridge, York; T.F.M.
Reseda lutea L. (64) Abundant in gravel pits, Ben Rhydding; J.E.D.
Claytonia alsinoides Sims (62) Bottom Hall, Danby (N.Z. 60); Mrs. F. H. Bell com. C.M.R.
Chenopodium ficifolium Smith (62) Waste land, Middlesbrough; I.C.L.
C. capitatum (L.) Aschers. (64) In sheep pen on farm, Otley; Miss A. M. Lister per F.H.
Geranium endressii x *versicolor* (62) Castle Howard Park (S.E. 76); T.F.M.
Melilotus officinalis (L.) Pallas (64) Cowpasture Road, Ilkley; J.E.D.
M. indica (L.) Ailioni (64) Allotment, Holgate Road, York; T.F.M.
Trifolium incarnatum L. (63) One plant, Halifax Sewage Tip; R.K.
T. glomeratum L. (63) With above; F.H.
T. hirtum All. (63) (det J.E.L.) Several plants with above; F.H.
T. tomentosum L. (64) (det D. McC.) Waste ground, Ilkley; J.E.D.
Coronilla varia L. (63) Sowerby Bridge Tip; F.M. Railway bank, Long Sandall Lock, 44/60; G. Oates.
Lathyrus aphaca L. (62) Railway bank, Middlesbrough; I.C.L. (63) Garden weed, Guiseley; H.D.S.
L. tuberosus L. (61) Staxton; Miss Robson per Miss M. Taylor.
Epilobium nerterioides Cunn. (62) Caydale Mill (S.E. 58); Y.N.U. (64) Pecca Falls and Thornton Force, near Ingleton; F.H. (65) Hardraw Force; F.H.
Saxifraga cymbalaria L. (64) Newby Hall grounds; F.H.
Oenothera erythrosepala Borbas (64) Martins Bank car park, Otley; F.H. Hymas's quarry, Knaresborough; F.H.
Polygonum lapathifolium L. (64) Waste ground, Ilkley; J.E.D.
Alnus incana (L.) Moench (65) Hornby Castle (S.E. 29); Y.N.U.
Calystegia sepium x *sylvatica* (63) Old Lane, Halifax; Dr. G. A. Nelson.
Mimulus moschatus Lindley (63) Increasing near Dewsbury; C.H.
Lamium maculatum L. (63) Abundant, old rail embankment, Guiseley; J.O.
Veronica filiformis Smith (62) Castle Howard Park; T.F.M. (64) Riverbank, Hartlington Raikes; F.H. Abundant at Leathley Corn Mill; G.A.S.
Lonicera xylosteum L. (62) Hornby Castle (S.E. 29); Y.N.U.
Artemisia absinthium L. (64) Cowpasture Road and Rupert Road, Ilkley; J.E.D.
Grindelia squarrosa (Pursch) Dunal. (det J.E.L.) (62) Nr. Whitby Docks; J.A.V.
Carthamus tinctorius L. (63) Halifax Sewage Tip; F.M.
Cichorium intybus L. (62) Roadside near Eston; I.C.L. Flatts Lane, Normanby, 45/51; I.C.L. (64) Grammar School field, Ilkley; J.E.D.
Lolium temulentum L. and *Echinochloa crus galli* (L.) Beauv. (63) Sowerby Bridge; F.M.
Hordeum pubiflorum Hook. (63) Halifax Sewage Tip; R.K.

BRYOLOGY

HEPATICAE: (F. E. Branson)

In this report I have included all the V.C. records together with a small handful of other records of interest made in various parts of the county. There are 22 vice-county records given below, a large proportion of them having been made at the joint meeting with the British Bryological Society.

Early in April 1965 I visited the limestone quarries at Burton Leonard (V.C. 64) in company with Mrs. J. A. Paton where we gathered an hepatic new to Britain, *Lophozia perssonii* Buch & S. Arnell. The day after, it was again found in Jackdaw Crag Quarry near Tadcaster (V.C. 64) by Mrs. Paton in company with Miss Dalby. I have seen it in both locations. There is a full account of this species in the *B.B.S. Transactions*, Vol. 5, part 3, 1968 by J. A. Paton and H. J. B. Birks.

Another species which has come under notice is *Riccia crystallina* L. It has been discovered that most of the material determined as this species in England is, in fact, *Riccia cavernosa* Hoffm. (see Mrs. Paton's paper in *B.B.S. Transactions* Vol. 5, part 2, 1967). Mrs. Paton has seen most of the Yorkshire specimens and has re-determined them as *R. cavernosa*. As all the Yorkshire material is probably referable to *R. cavernosa*, it is thought best to delete all the entries of *R. crystallina* from the record book and record them as *R. cavernosa*.

† denotes new county record * new vice-county record.

*44/39 *Anthoceros punctatus* L. (65) Stubble field nr. Little Langton Grange, Thrintoft, Sept. 1967; J. A. Paton, B.B.S.exc.

*44/79 *Preissia quadrata* (Scop.) Nees (62) Wheeldale Moor, July 1954; J. Appleyard.

Riccia cavernosa Hoffm. Records have been confirmed for V.C.'s (61) and (64)

44/54 *Ricciocarpus natans* (L.) Corda (64) Pond nr. Catterton Wood, Tadcaster, May 1967; D. R. Walker.

*44/71 *Riccardia incurvata* Lindb. (63) Edge of pond on clay, Thorne, Sept. 1967; G. A. Shaw.

*44/47 *R. sinuata* (Dicks.) Trev. (65) Ditch nr. Throstle Nest, Leckby, Sept. 1967; Paton & Horrill, B.B.S.exc.

*45/50 *R. palmata* (Hedw.) Carruth. (62) Vertical rock, N. of Greenhow Moor, Sept. 1967; J. Appleyard, B.B.S.exc.

*44/79 *Pellia neesiana* (Gottsche.) Limpr. (62) Old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.

44/16 *P. neesiana* (Gottsche.) Limpr. (64) Merryfield Glen, Pateley, Oct. 1967; F. E. Branson.

†44/47 *Fossombronia incurva* Lindb. (62) Disused railway line, Pilmoor, Sept. 1967; J. A. Paton, B.B.S.exc. New to England.

*45/70 *Hygrobiella laxifolia* (Hook.) Spruce (62) On stones, West Arnecliff Wood, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.

*44/76 *Ptilidium pulcherrimum* (Weber) Hampe (61) On willow, Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.

*45/70 *Calypogeia neesiana var meylanii* (Buch) Schuster (62) Sandstone rocks, West Arnecliff Wood, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.

†35/82 *Lophozia obtusa* (Lindb.) Evans (65) Birch wood between High Force and Holwick Bridge, Teesdale, Oct. 1967; G. G. Graham & D. W. Shimwell.

†44/36 *L. perssonii* Buch & S. Arnell (64) On earth, Burton Leonard quarries, April 1965; Paton & Branson. New to Britain.

44/05 *Leiocolea muelleri* (Nees) Jörg. (64) Rocks near Strid, Bolton Woods, Jan. 1968; F. E. Branson.

†35/82 *L. heterocolpos* (Thed.) Buch (65) Crevices in dolerite rocks, Holwick Bridge, Teesdale, Sept. 1967; Duckett. New to England.

44/35 *Solenostoma sphaerocarpoidea* (De Not) Paton & Warb. (64) Cliffs between Low Bridge and Birkham Wood, Knaresborough, Nov. 1967; F. E. Branson.

*45/70 *Plectocolea paroica* (Schiffn.) Evans (62) Rocks by R. Esk, East Arnecliff Wood, Glaisdale, Sept. 1967; Appleyard et al., B.B.S.exc.

*44/04 *P. paroica* (Schiffn.) Evans (64) Stream bank, Silsden, Aug. 1953; J. Appleyard.

*44/76 *Plagiochila asplenioides var major* Nees (61) Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.

*45/70 *Harpanthus scutatus* (Web. & Mohr) Spruce (62) Shaded sandstone rocks, West Arnecliff Woods, Glaisdale, Sept. 1967; Paton & Duckett, B.B.S.exc.

*44/47 *Odontoschisma denudatum* (Mart.) Dum. (62) With *Calluna* on damp peat, Pilmoor, Sept. 1967; A. C. Crundwell, B.B.S.exc.

44/05 *Scapania cuspiduligera* (Nees) K. Mull. (64) Rocks near Strid, Bolton Woods, Sept. 1967; J. G. Duckett.

*44/79 *S. scandica* (Arn. & Buch) Macv. (62) Stone in old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.

44/25 *S. irrigua* (Nees) Dum. (64) Cart rut off Penny Pot Lane, Harrogate, July 1968; F. E. Branson.

44/05 *S. aequiloba* (Schwaegr.) Dum. (64) Rocks by R. Wharfe, Bolton Woods, Jan. 1968; G. A. Shaw.

*44/58 *S. aspera* Bernet (62) Shaded calcareous boulders below Roulston Scar, Sept. 1967; J. A. Paton, B.B.S.exc.

*45/70 *Lejeunea cavifolia* (Ehrh.) Lindb. (62) Shaded riverside rocks East Arnecliff Wood, Glaisdale, Sept. 1967; J. A. Paton, B.B.S.exc.

44/05 *L. patens* Lindb. (64) Cliffs near Strid, Bolton Woods, Jan. 1968; G. A. Shaw.

Nomenclature follows the *Census Catalogue of British Hepatics,* J. A. Paton, 1965.

MUSCI: (M. Dalby):

There is an exceptionally long list of county and vice-county records this year thanks to the B.B.S. meeting at Northallerton in September 1967 and a most successful meeting of the Y.N.U. bryological group at Kirkham Abbey in April 1968. Both these reports have been published elsewhere in *The Naturalist.*

Other interesting records include Mr. G. A. Shaw's discovery of *Tetraplodon mnioides* (Hedw.) B. & S. with fruit, on a dead sheep near the Wolf Stones on Haworth Moor (63) in May 1968. There is only one other previous record for this species in V.C. 63, that of W. H. Burrell from Ellentree Clough, Holme, in 1928. Mr. Shaw also found *Pohlia elongata* Hedw. on Barkin Fell, Barbondale (65) in April this year. Also in April an expedition to Goyden Pot in Upper Nidderdale (64) by Mr. Shaw and Mr. Branson produced an interesting list of species including *Orthothecium intricatum* (Hartm.) B.S. & G., *Pohlia cruda* (Hedw.) Lindb., *Seligeria recurvata* (Hedw.) B.S. & G. and *Rhynchostegiella pumila* (Wils.) E. F. Warb. In November 1967 *Sphagnum subsecundum var. subsecundum* Nees, a comparatively rare variety of this group, was found in Merryfield Glen, Nidderdale (64) by Mr. Branson and myself.

*44/76 *Fissidens minutulus var. minutulus* Sull. (61) Kirkham Abbey Wood, April 1968; E. Crackles, Y.N.U.exc.

*44/79 *Distichium inclinatum* (Hedw.) B.S. & G. (62) Old ironstone mine, Spaunton Moor, Rosedale, Sept. 1967; J. A. Paton, B.B.S.exc.

*45/50 *Dicranella subulata* (Hedw.) Schimp. (62) Greenhow Moor, Sept. 1967; A. C. Crundwell, B.B.S.exc.

*44/58 *Dicranum strictum* Schleich. ex Schwaegr. (62) Little Gormire, Sept. 1967; J. Appleyard, B.B.S.exc.

*44/47 *D. polysetum* Michx. (62) Pilmoor, Sept. 1967; Duckett, Paton & Crundwell, B.B.S.exc.

*44/47 *D. spurium* Hedw. (62) Pilmoor, Sept. 1967; Duckett, Paton & Crundwell, B.B.S.exc.

*44/85 *Aloina brevirostris* (Hook. & Grev.) Kindb. (61) Greenwick Dale, Huggate, Aug. 1967; J. Robertson.

†44/05 *Cinclidotus mucronatus* (Brid.) Mach. (64) Rocks near the Strid, Bolton Woods, Sept. 1967; Duckett, Bell & Evans.

*44/87 *Barbula vinealis* Brid. (61) Thorpe Basset, Malton, April 1960; Crowson.

*44/76 *Trichostomum sinuosum* (Mitt.) Lindb. ex Herzog (61) Kirkham Abbey, April 1968; F. E. Branson, Y.N.U.exc.

†45/50 *Coscinodon cribrosus* (Hedw.) Spruce (62) Greenhow Moor, Sept. 1967; Duckett & Lobley, B.B.S. exc.

*44/76 *Grimmia trichophylla* Grev. (61) Kirkham Abbey, April 1968; M. Dalby, Y.N.U.exc.

*44/39 *Physcomitriella patens* (Hedw.) B.S. & G. (65) Little Langton Grange, Thrintoft, Sept. 1967; J. A. Paton, B.B.S.exc.

*44/49 *Ephemerum serratum* (Hedw.) Hampe (62) N. of Osmotherley, Sept. 1967; J. A. Paton, B.B.S.exc.

*44/34 *Bryum micro-erythrocarpum* C.M. & Kindb. (64) Between Spofforth and Wetherby, Sept. 1967; J. Appleyard.

(continued on p. 30)

THE YORKSHIRE

PROFIT AND LOSS ACCOUNT

EXPENDITURE

1967 £ s. d.		£ s. d.	£ s. d.
	General Printing:		
84 15 3	Circulars	58 9 3	
32 10 0	Members' Cards	36 0 0	
			94 9 3
72 15 0	List of Members		— — —
659 1 6	*The Naturalist*		757 9 9
	Sundry Expenses:		
41 12 2	Officers Expenses		34 15 7
19 18 1	Duplicating and Stationery		5 14 9
8 14 9	Bank Charges		14 11 6
3 2 0	Subscriptions and Donations		3 3 0
35 10 9	Cost of News Letters		50 0 0
			960 3 10
29 6 7	Profit		50 11 2
£987 6 1			£1010 15 0

BALANCE SHEET as

£ s. d.		£ s. d.	£ s. d.
	Accumulated Funds — General		
	Booth Fund	100 0 0	
	Cheesman Fund	100 0 0	
	R. C. Fowler Jones Legacy	250 0 0	
	E. G. Bayford Legacy	100 0 0	
	R. Chislett Legacy	500 0 0	
1050 0 0			1050 0 0
	Anonymous Fund		250 0 0
	Mycological Fund:		
	Balance Brought Forward	147 15 9	
	Add Sales *Cortinarius*	23 0 8	
147 15 9			170 16 5
1147 6 0	Ornithological Fund — Capital		1147 6 0
	Revenue:		
	Balance Brought Forward	111 2 1	
	Interest on Investments	66 0 0	
111 2 1			177 2 1
	Life Members' Account:		
	Balance Brought Forward	122 15 0	
	Less Transfer Subscription Account	15 0 0	
122 15 0			107 15 0
	Profit and Loss Account:		
	Balance Brought Forward	748 16 2	
	Add Profit	50 11 2	
748 16 2			799 7 4
24 15 0	Sundry Creditors		— — —
£3352 10 0			£3702 6 10

Auditors' Report

We have audited the foregoing Income and Expenditure Account and Balance Sheet of the Yorkshire Naturalists' Union with the books, records and vouchers produced to us and certify the same to be in accordance therewith and with the information and explanations we have received.

WHITHAM, SMITH, MITCHELL & CO.,
Chartered Accountants,
4–6 Harrison Road,
Halifax.

31st December, 1968.

NATURALISTS' UNION

Year to 30th September, 1968

INCOME

1967 £	s.	d.		£	s.	d.	£	s.	d.
734	13	1	Subscriptions and Donations				707	3	5
—	—	—	Life Members				15	0	0
141	5	5	Income Tax on Covenants				142	11	0
103	9	6	Bank Interest and Dividends				93	17	5
7	18	1	Sale of Publications				51	19	6
—	—	—	Dollar Adjustment					3	8
			CHISLETT MEMORIAL FUND:						
			Balance brought forward ...	271	17	7			
			Interest received	8	6	2			
				280	3	9			
			Less cost of Third Lecture ...	78	6	2			
			Balance	201	17	7			
£987	6	1					£1010	15	0

at 30th September, 1968

£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.
			INVESTMENTS (at cost):									
			ORNITHOLOGICAL ACCOUNT:									
			Nicholas Fund 3% Brit. Transport ...	100	0	0						
			Chislett Legacy, £600:									
			Treas. Stk. 5½% 2000/12	545	9	0						
			Treas. Stk. 5% 1986/89	501	17	0						
							1147	6	0			
			GENERAL ACCOUNT:									
			Booth Fund 3½% Conversion Stock ...	100	0	0						
			Cheesman Fund 3½% War Stock ...	100	0	0						
			4% Consols (Bank of England)	200	0	0						
			4% Consols (Post Office)	159	10	11						
			300 Unilever Ordinary Shares	522	1	6						
			250 Shell Trans. Ord. Shares	511	7	0						
							1592	19	5			
							2740	5	5			
			Less Reserve for Depreciation				235	0	0			
2505	5									2505	5	5
			BANK ACCOUNTS:									
			York County T.S.B.				449	8	3			
			Westminster Bank Current A/c.				310	16	8			
			Westminster Bank Deposit A/c.				253	10	8			
608	2	6								1013	15	7
			SUNDRY DEBTORS:									
			Income Tax Repayable on Covenants				142	11	0			
			Sundries including Accrued Interest				40	14	10			
239	2	1								183	5	10
£3352	10	0								£3702	6	10

*44/58 *B. bornholmense* Winkelm & Ruthe (62) Big Wood, Thimbleby, Sept. 1967; A. C. Crundwell, B.B.S.exc.
*44/83 *B. rubens* Mitt. (61) North Cave, Dec. 1966; F. Bell.
*44/49 *B. ruderale* Crund. & Nyh. (62) Cotcliffe Wood, Sept. 1967; A. C. Crundwell, B.B.S.exc.
*44/83 *B. violaceum* Crund. & Nyh. (61) North Cave, Dec. 1966; F. Bell.
*45/50 *B. violaceum* Crund. & Nyh. (62) Ingleby Greenhow, Sept. 1967; Crundwell & Appleyard.
*44/58 *Mnium rugicum* Laur. (62) Gormire Lake, Sept. 1967; J. A. Paton, B.B.S.exc.
*44/92 *Thamnium alopecurum* (Hedw.) B.S. & G. (61) Elloughton, Dec. 1966; F. Bell.
*54/24 *Brachythecium salebrosum* (Web. & Mohr.) B.S. & G. (61) Kelsey Hill, Keyingham, July 1955; J. Appleyard.
*44/58 *Isopterygium seligeri* (Brid.) Dix. ex C. Jens. (62) Tup Hag Wood, Hawnby, Sept. 1967; Duckett, Evans & Bell, B.B.S.exc.
*44/76 *I. depressum* (Bruch) Mitt. (61) Kirkham Abbey Wood, April 1968; F. E. Branson, Y.N.U.exc.
*44/76 *Plagiothecium denticulatum* (Hedw.) B.S. & G. (61) Kirkham Abbey Wood; F. E. Branson, Y.N.U.exc.
*44/58 *P. curvifolium* Schlieph. ex Limpr. (62) Roulston Scar; J. Robertson, B.B.S.exc.
*44/76 *P. succulentum* (Wils.) Lindb. (61) Kirkham Abbey Wood, April 1968; M. Dalby, Y.N.U.exc.

Nomenclature from the *Census Catalogue of British Mosses*, 3rd edition, E. F. Warburg, 1963.

DONALD F. WALKER
(1915–1968)

News of the sudden death on 20th September 1968 at the age of 53 of Donald F. Walker came as a great shock to his many friends in the Union and more particularly perhaps to those of us who had spent the previous weekend in his company at York University at the joint Y.N.U.–Y.N.T. Conference on 'The Changing Face of Yorkshire'. Then, he had been apparently in excellent health and in good spirits. Throughout the arranging of this most important and enjoyable conference he had taken a very active role and as the culmination of his share of all the months of planning was very much at the core of things during the actual event; present (like the Trust's secretary) where and whenever needed, bringing light relief with his own particular brand of humour and in general acting the gay and perfect host. On this occasion, too, he was discussing with me aspects not only of future Union activities, but also of his own personal future plans which were a matter of some concern to him at the time. Little did one imagine then that the future for him was to be of such short duration.

D.F.W. was educated at Bradford Grammar School and had subsequently been employed by the Musgrave Estates Company, of which until comparatively recently he was company secretary. He had been a member of Bradford Naturalists' Society since December 1942, their ornithological recorder continuously since 1950, and President in 1952–3 and again in 1960–1. It was on joining the Bradford Naturalists' in the mid-1940's that I first met Donald, since when we had shared holiday visits to the Cairngorms and Spurn, and met at numerous Y.N.U. sectional, business and field meetings. He had an almost boyish sense of fun, while at the same time displaying a more serious side in his studies and an acute sense of responsibility where official duties were concerned. He had joined the Y.N.U. in 1945. At the first Ornithological Section elections which I can recall, he was already a representative on the Union Executive. From 1965 to the time of his death he was Chairman of the Executive. Only the second person to fill this position, he proved to be an ideal choice. He had been one of the most regular of Vertebrate Section members in his attendance at field meetings.

With a wide range of natural history interests, he was a frequent and popular lecturer to local societies, schools (including his own old school) and other organisations. The benefits to the Union of these activities are impossible to estimate. He had the affairs of the Union very much at heart and his share in Union activities extended into a family participation. We came to know his wife and two children almost as well as we knew Donald himself. In their loss, and ours, the Union extends to Audrey, Angela and Richard a sincere deep-felt sympathy.

R. F. Dickens

BOOK REVIEWS

Vanishing Animals of the World by **Richard Fitter,** illustrated by John Leigh Pemberton. Pp. 144, with 43 coloured plates and 29 line drawings and numerous maps. Midland Bank in association with Kaye and Ward, 1968. 30/–.

The production of this book deserves consideration even before the contents are reviewed. First of all, it is a landmark in natural history publication in Britain in that the royalties go to the British Appeal of the World Wildlife Fund, and also in the approach that it takes. Here is a beautiful book — 'a pleasure to own' as the dust-jacket rightly says, lavishly illustrated and handsomely bound, offered at the low price of thirty shillings. This has been achieved by the support of the Midland Bank, whose calendars and advertising have pleaded the cause of conservation for some years. The Duke of Edinburgh in his foreword, and Peter Scott in his introduction, acknowledge the debt of conservationists to the Midland Bank, and one can but echo their words in hoping that this book has the success it deserves.

In content, this is a book on mammals — those which appear in the Red Date Book of the International Union for the Conservation of Nature. These are all in danger of extinction and three hundred and seventy species are listed in the appendix to the book (270 considered officially in danger). The main body of the text is a continent by continent review of these vanishing mammals, and Richard Fitter's text is a masterpiece of conciseness combined with readability. The whole story shows how a number of factors may have worked against various species and their habitats, but this is not a saga of unrelieved gloom. There are chapters on animals which have been saved, such as the Sea Otter and the American Bison, and on how other species could be saved, by translocation, captive breeding and timely legislation.

The illustrations are, of course, a great feature of this work and form a unique gallery of rare animal pictures. Some of the colour reproductions will be familiar to those who study calendars on their visits to the Bank, but the black and white sketches have a great deal of charm also. Each of the forty-three colour plates is accompanied by a distribution map of the species concerned, and there are also maps indicating the origins of the species listed in the appendix.

It would be pointless here to try and deal in depth with the species covered, but if you have not already heard of the Chatham Island Rice Rat or the Bactrian Wapiti or many others, you will if you buy this book. T.M.C.

Animal Life in Europe. The Naturalist's Reference Book. By **J. Graf.** Pp. 595 with 16 plates and numerous text figures. Frederick Warne, 1968. 75/–.

The British tourist in Europe, interested in natural history, has for a long time been better served by the handbooks to plants than by those dealing with animals. Dr. Graf's book goes far to restore the balance. Originally designed for European readers it is now translated and published in the English version. The problem of selection in any book designed to cover all the animal groups in Europe is an enormous one and the criteria of selection must vary from group to group. In this book of almost 600 pages, half is devoted to the vertebrates, 45% to the arthropods and 5% to molluscs and worms. The vertebrates are treated in considerable detail and the reader has a good chance of identifying any vertebrate to species by the use of this handbook alone. A brief description of each species is given with notes on habit, habitat and distribution. An additional and particularly attractive feature of the book is the inclusion of sections dealing with mammal tracks and droppings, birds' nests, feeding places and pellets and an appendix of 35 pp. on the identification of bird songs. The invertebrate half of the book is organised partly on a taxonomic and partly on a habitat basis. Molluscs, worms and spiders are each dealt with as compact taxonomic sections. So too are the Lepidoptera, although their subdivisions into 'colourful butterflies of the open country', 'colourful butterflies of woodlands and parks', 'inconspicuous butterflies and moths', etc., are less helpful for quick reference. Other sections are grouped on a habitat basis such as insect larvae living underground, the leaf miners, domestic pests, galls, etc., and these are designed and will succeed in not only allowing quick reference to the name of the animal but to the knowledge of other kinds of animals likely to be found associated with it.

The text is concise and adequate and a notable feature, and one adding immeasurably to the usefulness of the book, is the illustrative material comprising excellent marginal drawings of the animals averaging almost four per page, as well as 16 full-page plates, 14 of which are in colour. E.B.

Bird Navigation by **G. V. T. Matthews.** Pp. x + 197 with 40 text figures. Cambridge Monographs in Experimental Biology No. 3. Cambridge University Press, Second Edition, 1968. £2.

A comparison of this second edition with the original in 1955 shows how much the subject has developed and grown in scientific stature in the last thirteen years with the introduction of new and sophisticated experimental techniques. This has necessitated the re-writing of the text completely, and as Dr. Matthews points out in his new preface, over half the bibliography is of selected new work which has appeared since the previous edition. The book is an excellent review of both the work done in this field and the theories currently advanced in the subject.

To those versed in the theory and practice of navigation, the experimental analysis and testing of such theories as inertial navigation, navigation by geophysical grids, astronomical grids and a grid derived from the sun's co-ordinates will be fascinating, but the average reader interested in bird migration will find it heavy going.

I.W.

The Book of Bird-Watching by **R. M. Lockley.** Pp. 127 with 21 black and white photographs and several line illustrations. Arthur Barker Ltd., 1968. 25/–.

As one would expect from a writer whose published books are about thirty in number and who has made many original contributions to our knowledge of birds, this book is both readable and informative. Aimed mainly at the beginner, it nevertheless outlines many sophisticated techniques including radar tracking, while more experienced bird-watchers could well learn something about bird psychology and physiology from it. Covering such a wide field in a comparatively small compass the author has, of necessity, had to be brief. In a few instances one feels that, keeping in mind that the book is primarily a guide for the beginner, a little further explanation would have been advantageous. Statements such as 'Birds have a poor sense of smell' are not particularly helpful unless comparisons are made or standards quoted. Fortunately the lucidity of the writing is of a high order and very few are the passages that leave room for any misunderstanding or misinterpretation.

The photographs vary in their quality and value as illustrations, but the line drawings are very satisfactory in both respects. One small error I would like to correct: it is not necessary as the author says, to apply to the Nature Conservancy for a permit to photograph birds at the nest. One only needs to do so if the species to be photographed is on the list of those receiving special protection.

This is a book that can be thoroughly recommended, not only for beginners, but to those bird-watchers who wish to be able to refer quickly to a summary of modern knowledge and thought on almost anything from binoculars to bird navigation.

A.G.

Hours and The Birds: a Saskatchewan Record by **R. D. Symons.** Pp. 215, generously illustrated with the author's own line-drawings and 17 colour plates. Toronto University Press; London: Oxford University Press. £5 19s. 0d.

I found this book entirely satisfying. It is by a man who has obviously retained a deep love for his mother country (evident from his frequent references to our birds, customs and literature) but at the same time has become thoroughly enchanted by the country of his adoption. The book is an account of the bird-life of Saskatchewan, an area whose topography, climate and history are outlined. The author then deals in greater detail with the various faunal zones and their typical birds. He does not follow the pattern of a guide or handbook, but his accounts of the groups of birds are more of personal observations and consequently of greater interest, and much more graphic. The pages of field sketches are unique and quite delightful. The artist comes through equally in the prose, to make this as vivid as his pictures. The tenor of the whole book is refreshing in this age when it is fashionable to treat birds too much as objects of scientific study only. Symons acknowledges an inspirational debt to Gilbert White. Here is a book in the same tradition as *The Natural History of Selborne* — I liked it immensely.

Besides a bibliographical appendix there is one containing advice for would-be bird-watchers, and another constitutes a check-list of the birds of Saskatchewan. It is very useful to have three separate indices for birds; for plants; and for mammals, fish and insects. And at the end of the final index we find once again another of those charming field-sketches.

R.F.D.

Spurn Bird Observatory Report for 1967.

Although this report was available by mid-September 1968, the editors apologise for its *late* appearance!

It follows the established pattern in the main, with the customary sections on spring and autumn migration and on wader migration. These are so packed with facts and figures that they do not always make for easy reading and it is a relief to come to one of the few tables. Personally I would prefer more use to be made of histograms, graphs and tables where possible.

As usual there is a full systematic list, a section on the status of breeding species and ringing, retrap and recovery lists. In addition, this present report carries a special feature on the autumn migration of seven selected passerines and a list of all species recorded at Spurn Bird Observatory.

In the section on breeding birds, the statement (without elaboration) that 42 singing Skylarks suggests a breeding population of ca. 45 pairs will cause some wonderment. Similarly it may be asked if the fact, on its own, of 33 singing Dunnocks would not suggest *fewer* pairs of birds, rather at least 40. One would suspect, too, that the statement that foxes took every (Little Tern) chick is not based entirely on direct observation.

The list of birds recorded at Spurn Bird Observatory will be puzzling to many for some of its inclusions and for the omission of other species. Clarification is needed when this list is next revised, to put its objectivity beyond doubt. Ruddy Shelduck is included but not Flamingo and Red-headed Bunting. One guesses that some species (e.g. Stilt Sandpiper and Buff-breasted Sandpiper) listed in Chislett (Birds on the Spurn Peninsular) have been omitted because of a more rigid definition of area. Since the present list is said to be based on Chislett's, a statement to this effect would remove any suspicion that there might be other reasons for omitting them. Is it the age of the record which excludes Houbara Bustard, Little Bittern, Glossy Ibis? Yet Blyth's Reed Warbler, Spotted Crake, Pallas's Sand Grouse and White-tailed eagle are in. Water Pipit is not included; Blue-headed Wagtail, Arctic Redpoll and Black-bellied Dipper are. Lesser Kestrel and Red Grouse are surprising species to have been recorded at Spurn, yet Black-necked Grebe appears not to have been seen. It would have been useful, as in Chislett's list, to have had years indicated for those species of only one or two occurrences.

In the recoveries section the species names do not stand out sufficiently, especially on p. 71.

In 'Autumn Migration of Small Passerines at Spurn', P. R. Evans repeatedly takes Spurn ringers to task for not ageing birds caught. I have often felt that those who do this confidently, may also often do it incorrectly and in the particular circumstances obtaining at Spurn it is often better not to require too great precision in this respect. I must confess to being puzzled about the object of the exercise of this paper and the discussion and conclusion seem in fact to reach no conclusion at all. To claim that three recovered Redstarts (ringed at Spurn) were of Continental origin, whilst Whitethroat and Willow Warbler were British migrants is quite unfounded. There is no basis for claiming that the majority of Spurn Wheatears originate further west. Big falls of this species often coincide with those of Redstart and Pied Flycatcher. Those who know Spurn well will realise that the totals of Whitethroats caught vary less from year to year than those for Redstart and Garden Warbler because a high proportion of the former are in fact local breeders. With too little to work on, this paper strikes me as premature.

All in all, the 1967 report maintains the standard of its three predecessors, attractively produced and full of meat. All who have visited Spurn and many others besides will wish to obtain copies. They are 3/6d. each, obtainable from the secretary of the Spurn Bird Observatory Committee, or from the Spurn Warden. R.F.D.

The Foxes of Beachy Cove by **Harold Horwood.** Pp. 190. Peter Davies, London, 1968. 25/-.

A North American idyll, set in Newfoundland, in which the author watches foxes in particular and wildlife in general. The actual observations on foxes and the speculation on the unseen sectors of their lives link together well, and the whole makes a very pleasant and readable book. To me, at least, this type of book can do a great deal towards arousing sympathy for wildlife in areas where, as yet, the full squeeze of civilization has yet to be felt. Not by any means to be regarded as a book on foxes exclusively. T.M.C.

Ornithological Report (1967) for Northumberland, Durham and the Farne Islands (published August 1968).

The reports for the three areas are published together in one volume of *Transactions of the Natural History Society of Northumberland, Durham and Newcastle upon Tyne* (Vol. XVI, no. 5). Available from The Hancock Museum, Newcastle upon Tyne, NE2 4PT, at 10/6.

The Durham section is edited by D. G. Bell; that for Northumberland by J. D. Parrack and for the Farnes by Grace Hickling, whilst a ringing summary is contributed by P. Yeoman. The report reflects the general increase in Golden Oriole sightings in 1967, and records breeding of Garganey, Goosander and Common Gull in Durham. Fulmars bred at three inland quarries in Northumberland whilst in late May two birds were seen circling Durham Cathedral tower, where Barn Owls apparently nested successfully. It is pleasing to learn that the breeding status of heron improved, but in contrast no Peregrines were proved to breed in either county. It was perhaps appropriate that one of the American waders (Lesser Yellowlegs) should have occurred in Co. Durham, at Washington. Others were Baird's and Pectoral Sandpipers. The first record this century in Durham for White-winged Black Tern is documented, and the first Greenish Warbler was recorded in 1967.

It will be of interest to Yorkshire ornithologists that as many as 10 breeding pairs of Stonechats are on the north-east coast of England. The Y.N.U. exchange copy of this attractive, well-printed and punctual report is held by H. O. Bunce, recorder for V.C. 61. R.F.D.

Studies in Invertebrate Behaviour by **S. M. Evans.** Pp. vii + 110, with 33 figures in the text. *Scholarship Series in Biology*, Heinemann, 1968. 16/-.

This is a splendid little book covering a wide range of behavioural studies. In an introduction and seven other chapters the author is concerned with courtship, feeding, location of hosts by parasites, movement, escape responses, social behaviour, and certain aspects of learning. As a member of a scholarship series should be, this is truly scholarly in content and presentation. The material is well chosen and the skills of a high level schoolmaster are patently obvious. The dilettante sixth-former will be able to dip into it to provide material for examination questions but the genuine student will also be able to obtain a wide grasp of the subject as a whole. The additional reading list of books and research papers is impressive.

Strongly recommended to sixth-formers and University students of all levels; although rather small, well worth its price. H.H.

The Dance Language and Orientation of Bees by **Karl von Frisch.** Translated by Leigh E. Chadwick. Pp. xiv + 566 with 454 figures and 45 tables. 1967. Harvard University Press; London: Oxford University Press. 110/-.

As early as 1788 Ernst Spitzner had described the dancing of the bees and had correctly interpreted it as a method of communication. As has not infrequently occurred, this early discovery was forgotten and the rediscovery was made independently by several people, one of them being Dr. Frisch. The intensive investigations of the roles of these dances in the economy of the hive, conducted by von Frisch and his co-workers over almost 50 years represent one of the most fascinating and rewarding episodes of 20th-century biology. The bare essentials of the discoveries, namely that a communication of precise information about the external world is involved and that this is unknown elsewhere in the whole animal kingdom apart from man, are now widely known. A bee finding a rich source of nectar or pollen near the hive stimulates others by means of the 'round' dance to go out and search in all directions within the area near the hive for the newly-discovered food supply. They are guided by olfactory clues — the fragrance of the flowers clinging to the dancer's body in the hive and the odour released from the scent organ of the dancers when they have returned to the flowers. A bee finding a rich but distant food source carries out on her return the 'tail wagging' dance on the vertical comb in the hive. Like the round dance, this announces the existence of the food supply, the kind of flower and the potential productivity of the supply. It also makes known the distance to the goal by means of the tempo of the dance and the compass direction of the goal by means of the direction of the straight portion of the run in the dance pattern.

In this book Professor von Frisch recounts with a wealth of illustration and in considerable detail the experiments conducted largely by himself and his many co-workers and relates their findings to those of other workers. Since the elucidation of the 'language' of the bees inevitably involves the study of how they find their way about, the book is divided into two sections. The first, amounting to two-thirds of the book, deals with the dances themselves. After an initial chapter on methods of study, the round dance and the wagging dance are described and discussed in the greatest detail. Further chapters are then devoted to related topics. Racial differences in the language are specified and the possible phylogeny of the dance is discussed by reference to other *Apis* species, to the Meliponine bees and to some other insects. The dances are used for objectives other than the collection of nectar and pollen — to the collection of water when supplies in the hive are low, to the collection of propolis and to the selection of a suitable site for occupation by a swarm. Especially interesting and important are the accounts of the regulation of the activity of the foragers according to the food supply and the modification of the bees' activity in response to their own requirements. The second section of the book deals with the orientation of the bees, both on long-distance flights, where landmarks and the compass sense are of prime importance, and when near the goal when both vision and olfactory discrimination are involved.

As an authoritative summary of a wide field of investigation about bee behaviour, this book is important for the research worker. It is also a fascinating book for the general reader. Professor von Frisch recaptures the excitement of the long and arduous process of discovery, the false clues, the successes, the misinterpretations sometimes themselves leading to further advances, and finally the recognition, at the end of 50 years of painstaking work, of further and more subtle depths of ignorance. As he says on p. 230, although we may be pleased that we understand these dances so well, how clumsily do we interpret the information given by the bee. In order to interpret the dance we must have a distance curve and a circular diagram both pieced together from many single observations. We must have a stopwatch, the azimuth curve, a compass, a surveyor's tape and some assistants. But the bee need follow only a few dance circuits in the dark hive and then set out in free flight directly for the goal!

E.B.

East Yorkshire Field Studies edited by **J. W. Neale, Brenda E. Moon** and **L. H. Emery.** Pp. 34 with 3 figures. Obtainable from J. W. Neale, Dept. of Geology, The University, Hull. 4/6.

This joint publication of the Hull Geological Society, the Hull Scientific and Field Naturalists' Club and Field Studies Association (Hull and East Yorkshire) contains four papers. K. Fenton writes on the breeding birds of the Flamborough cliffs and L. H. Emery on the seaweed and animal communities of the rocky shore at Flamborough. Miss Crackles contributes an account of 'Some Plant Associations of the River Hull Valley'. This contains interesting information, based on old maps, which throws light on the probable history of the flora of the Leven Canal and the presence there of *Calamagrostis stricta* and which strongly supports her grounds for regarding this as a relict flora. Messrs. Witham and Boylan describe the famous middle and upper Jurassic strata of the South Cave area and their fossil fauna.

We wish every success to this well-printed and produced publication and hope that the financial support from East Riding naturalists which it thoroughly deserves will be adequate to ensure a succession of further issues.

Highland Year by **L. MacNally.** Pp. 117, with 83 black and white photographs. Phoenix House, London, 1968. 36/–.

At the south-eastern end of Loch Ness the author of this book lives, in close contact with a fair cross-section of the Scottish fauna. Deer especially are his neighbours and also his work, for he is a Head Stalker, and it is with these animals that his book reaches its highest point. Red, Roe and Sika are all covered in his observations and pictures which form a graphic coverage of their year under highland conditions.

Apart from deer, all the inhabitants of the hill are here too — Fox, Wild Cat and Golden Eagle, Grouse, Ptarmigan and Mountain Hare. Foxes particularly engage the author's attention, and his stories give them credit as wily adversaries of the deer conservator and keeper. There are also observations on Golden Eagles which obviously could not be made by anyone who was not abroad in their habitats at all times, in all weathers, and consequently these, like the rest of the author's observations, have about them the quality that has led to this book receiving high praise in many quarters. Just the book to read before that next Scottish holiday.

T.M.C.

British Shells by **Nora F. McMillan.** Pp. 190 with 32 colour plates and 48 plates of line drawings. Frederick Warne and Co. Ltd., 1968. 50/-.

The intention of the publishers was to produce a revised edition of Edward Step's *Shell Life* (1901), one of the many winners in their *Wayside and Woodland* series. Mrs. McMillan agreed to do this but, to use her own words, "It proved impossible to bring up to date the Victorian prolixity of the original, and an entirely new book had to be written".

A devoted professional conchologist with long experience among museum shell-collections, the author is also an active member of the Yorkshire Conchological Society, well qualified to undertake the formidable task. The result is an attractive book of good value, generously illustrated and accurately printed, recommended to shell-collectors and those concerned with the identification of the British shell-bearing mollusca. Apart from a group of tiny *Pisids*, all the species living in the British Isles and shallow seas around them are described, covering nearly 600 marine and 180 freshwater or terrestrial forms, and of these no fewer than 355 are figured.

On the whole the colours of the sea-slugs and marine shells are nicely rendered and scales are included; but the plate of land-slugs is misleading — each animal being unrelated in size and lacking scale. Bridget Finlow is responsible for much of the black and white work, mostly satisfactory but lacking critical care among the smaller land species.

J.A.

Drawings of British Plants: Part XXV: Plantaginaceae, Illecebraceae, Chenopodiaceae by **Stella Ross-Craig.** G. Bell & Sons Ltd. 13/6.

It is always a pleasure to greet the arrival of another part of Stella Ross-Craig's *Drawings of British Plants.* With the previous part she brought her total of species illustrated in this series to over 1,000. The present part contains 36 plates and the drawings have all the elegance and clarity of outline which invariably distinguish her work. Those of the Goosefoots are likely to be of particular value on account of the dissections and the details of seeds and surface markings of the testas, though a comparison of the testa details with Clapham, Tutin and Warburg's figure 36 shows what appear to be marked differences in four of the eight species depicted. The erect habit drawings of *Plantago coronopus* and *Atriplex laciniata* look unnatural and why has not the pronounced mealiness of the leaves of the latter been indicated as with the Goosefoots? The *Salicornias* look deceptively easy to distinguish as here depicted; the drawings are beautiful, but five are enough of this distressing genus! On the other hand one regrets the exclusion of *Chenopodium glaucum* and *C. hybridum.* Surely they should have been given the benefit of the doubt as to status by being included. But these are minor criticisms; I have nothing but admiration for Miss Ross-Craig's drawings which are as aesthetically pleasing as they are scientifically accurate.

W.A.S.

British Mosses and Liverworts by **E. V. Watson.** Second edition: pp. xv + 489, with 18 photographic plates and 242 text figures. Cambridge University Press. £4.

Thirteen years have elapsed since the publication of the first edition of this book, which received an enthusiastic reception from bryologists. One slight criticism of the original work, especially from bryologists in the North of England, was the omission of a number of species which we were frequently coming across. This has now largely been redressed, and in this new edition over 60 species are now included for the first time, examples being *Dicranum strictum, Barbula cylindrica* and *Acrocladium stramineum.* The Sphagna receive more extended treatment, and revisions of the genus *Plagiothecium* and the bulbiferous species of *Pohlia* are most welcome. I had hoped that new light might be shed on *Philonotis caespitosa,* which our Mr. Branson has so persistently recorded of recent years; however, as the experts themselves are scarcely agreed as to the value and limits of this species, its omission is hardly surprising. Considerable re-arrangement has taken place among the liverworts and it is valuable to have a full description of *Riccia sorocarpa* along with *R. glauca,* the figures for the latter also having been re-drawn. The field key of the first edition has been omitted from the second as it had been found that bryologists were making little use of it. The new price of £4 may seem rather high, but as Y.N.U. members well know, printing costs have risen sharply of recent years.

Dr. Watson has performed a most valuable service to bryology by the publication of this new edition of his excellent work. To the practising bryologist it will be quite indispensable.

G.A.S.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
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R. F. Dickens
Ellen Hazelwood, F.L.S.
J. H. Flint, F.L.A., F.R.E.S.
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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THE YORKSHIRE NATURALISTS' UNION

ENTOMOLOGICAL SECTION

Field Meetings, 1969

No formal field meetings have been arranged for the coming season; instead it is hoped to organise more excursions than in the past, but at very short notice with particular attention being paid to weather and collecting prospects. Localities to be visited will be decided upon as the season progresses.

Will anyone (entomologist or non-entomologist), who would like to be kept informed please forward a stamped addressed envelope or, preferably a telephone number to: Mr. P. Skidmore, Museum and Art Gallery, Chequers Road, Doncaster.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

THE LEPIDOPTERA OF YORKSHIRE

Elsewhere in this issue will be found the fifth part of this paper. The final parts should appear later this year; at the end of the final part we hope to have space for the more important corrections and additions. In the introductory remarks to the first part, published in April 1967, we said: 'We shall welcome advice which will enable our records to be made more accurate.' Little or no such advice has been forthcoming. The editor would welcome notes drawing attention to errors or omissions so that these can be included in the final part.

It is intended to follow the main paper with a further paper in 1970 in which is given an analysis of the present list and a comparison with Porritt's List, drawing attention to the changes that have occurred since the turn of the century.

C. I. Rutherford,
Longridge, Macclesfield Road,
Alderley Edge, Cheshire.

THE REDISCOVERY OF *OROBANCHE ALBA* IN WENSLEYDALE

J. D. LOVIS

Department of Botany, University of Leeds

The Distribution of *OROBANCHE ALBA* in the British Isles

The distribution in the British Isles of the Thyme Broomrape, *Orobanche alba* Stephan ex Willdenow (*O. rubra* Smith), is very curious. The majority of its known localities are situated on the western seaboard, predominantly in Scotland and there especially in Skye, but also in Cornwall and, very discontinuously, around the Irish coast (17). The Yorkshire localities are the only inland stations in Britain, apart from a solitary 1897 record from Cawthorpe Woods, a reputedly unlikely habitat, in N. Lincolnshire (3). The logic of such a distribution is not obvious, but whatever factor limits the distribution of this parasite in Britain, it is clearly not the presence of its host.

Previous Yorkshire Records

The Yorkshire localities fall into three groups. There is a single locality in Upper Teesdale, where it was recorded from whin-sill at Holwick by F. A. Lees (13). The date of this discovery is not known and no specimen has been traced. *Orobanche alba* has apparently not been found at Holwick or elsewhere in this district by any other botanist. The other Yorkshire localities are all either from the limestones of Wensleydale, or from the Craven district. There are no records for the East Riding.

In Craven the plant has always been excessively rare, isolated spikes being recorded at considerable intervals, and on very few occasions overall. A valuable analysis of the West Yorkshire records has been provided by Sledge (22), so only the briefest summary need be given here. Thus there are records for the last century from Malham Tarn (1801) and from near Settle (1811, 1854). In this century it has been seen between Kettlewell and Coniston (1908), at Norber (1919), and most recently at Malham (1953).

I am indebted to Miss Margaret Hartley of Cartwright Hall for the information that there is in the Lees Herbarium a previously unknown specimen from an unrecorded locality: '*Orobanche rubra* — On *Thymus* on limestone scars. Kingsdale above Ingleton, M.W. Yorks. 7th Aug. 1886. F. A. Lees.' It is remarkable that Lees never published this find. His own copy of *Flora of West Yorkshire* (also at Cartwright Hall, and again I am indebted to Miss Hartley) bears a pencilled annotation in his own hand: 'L. Kingsdale Scars, 7.8.88'. This latter date is more probably correct, since if the find was really made in 1886, it would surely have been included in the 1888 Flora (9).

The history of *Orobanche alba* in Wensleydale is very different from that in Craven. *O. alba* was first found in Wensleydale by James Ward on 'The Shoal, Leyburn, upon limestone' (23, p. 290). A specimen collected by Ward on Leyburn 'Shoal' on 19th July 1835 is in the British Museum Herbarium (A. C. Jermy, pers. comm.). In the first edition (1863) of his North Yorkshire Flora (1) Baker writes that 'I saw this species in 1861 at Leyburn Shawl, where it had been met with previously by Messrs. Ward and Pulleine', but cannot add any other localities. However, in the course of the next twenty-five years, the plant was found in several other localities. Thus in 1888 Percival (15) writes 'On the Main Limestone Scar of Leyburn Shawl as far as Preston; and on the same series of rocks above Carperby, over 1200 ft.', and in the same year Lees (9) notes that 'it occurs . . . in North Yorkshire at a level rising from 750 ft. (about Leyburn) to 1600 ft. on Nappa Scars.' Thus it was possible for Baker in the second edition (2) of his Flora to write (p. 164) 'From Askrigg to Carperby the hills stand boldly out towards the stream. There is along their edge an almost continuous line of the scars of the Upper Limestone, on most of which *Orobanche rubra* grows.' The introductory section of Baker's work in which this statement is made was issued however in Sept. 1888 and it is significant that in the same year John Percival writes (16) concerning *O. rubra* on Leyburn Shawl that 'it is now fast disappearing altogether'. The cause of this decline is not known, but there has been an almost complete dearth of records for *O. alba* in Wensleydale during the present century. Indeed, it seems that until the discovery which is the subject of this paper was made, R. W. Butcher, who found one specimen (or possibly two, but not more) on Leyburn Shawl on 12th August 1923 (*fide* R.W.B., *in litt. ad* W. A. Sledge, 11.8.68), may well have been the only living botanist to have seen this broomrape in the North Riding.

OROBANCHE ALBA ABOVE CARPERBY

The discovery in July of this year (1968) of a substantial population of *Orobanche alba* in Wensleydale above Carperby was therefore entirely unexpected. On the occasion of the initial find, on 28th July, it was established that the broomrape occurred along a stretch of ground some two or three hundred yards in length and rising (in approximate figures) from 1000 ft. to 1200 ft. at the eastern end. A more leisurely visit five days later (2.8.68) in the company of Dr. W. A. Sledge resulted in a count of forty spikes and there is little doubt that some spikes remained undetected. *O. alba* occurs along a line of grassy broken ground at the base of the limestone scar, but above the bare scree patches. This situation is occupied by an open community in which only a small number of species of flowering plants occur with significant frequency. Local dominance is shared by *Sesleria albicans, Festuca ovina, Thymus drucei* and *Helianthemum chamaecistus*. The only other associates of consequence are *Festuca rubra, Koeleria cristata, Poa pratensis, Galium sterneri, Linum catharticum, Campanula rotundifolia* and *Lotus corniculatus*. (Nomenclature according to (4)). The locality is almost certainly an unusually warm site. It is directly south-facing and owing to the gradient of the slope, a gentle curve of the strata and the protection afforded by the surrounding topography, it must gain full benefit from its exposure to the sun.

THE ORIGINAL DISCOVERY OF THE CARPERBY LOCALITY

Evidence recently adduced by Dr. Sledge and Miss Hartley makes it virtually certain that this precise locality was known to Lees and further indicates that the station was probably first discovered by John Percival in 1884. The programme issued for a Y.N.U. meeting in Upper Wensleydale in June 1884 (20) mentions several notable plants as being present in the vicinity, but does not include *Orobanche alba*. However, a revised version of this programme was subsequently produced, in which '*Orobanche rubra* (Scar above Carperby)' was included. This was issued in 1885 together with a reprint of another article by Lees (7) as a small privately printed booklet (8). Furthermore, a specimen exists in the Lees Herbarium at Cartwright Hall labelled in Lees' hand thus: '*Orobanche rubra*, Sm. On Thyme on the limestone, Scar top, Carperby 1200 ft. Alt. Wensleydale, N. Yorks August 22nd '84. F. A. Lees.' However, it seems clear that the discovery was first made by John Percival, then residing in Carperby (later Professor Percival of the Kent Agricultural College), who evidently collaborated closely with Lees (then living at Gayle near Hawes) at this time, and was responsible for several other floristic discoveries in Wensleydale in this same year (7, 8).* The site is more precisely indicated in another article by Lees (10) of much later date (1908), where he refers to *Orobanche rubra* affecting 'one line of scar-slopes only, those between the Oxclose, above Carperby (by Locker's Tarn, . . .), and those above Preston to Leyburn's Shaw-hill "Shawl".'

VARIATION IN *OROBANCHE ALBA*

The *Orobanche alba* inflorescences seen above Carperby in 1968 showed considerable variation in both size and colour. Some small spikes carried only four or five flowers, whereas the largest spike seen bore nearly thirty flowers and stood about six inches high. The population showed a surprising range of variation in the degree of development of purplish colour in the inflorescence. The occurrence of very different colour forms within this species has long been recognized (18, 19), but the descriptions available of the colours found in British specimens are not very precise. It would be of considerable interest to know whether or not the Yorkshire plants differed from those found in the ecologically and geographically very distinct western maritime localities, particularly since 'most British specimens have deep reddish fls (*O. rubra* Sm.) but the type common on the Continent, with much paler fls, is sometimes found' (4). The colour of all the Carperby specimens is very different from the illustrations provided by both Keble Martin (6) and McClintock and Fitter (14), and is much closer to my recollection of a population seen in the Braunwaldalp, Kanton Glarus, Switzerland, in 1966. Descriptions of the colour of Yorkshire specimens appear to be few. Lees (11, p. 797) wrote 'old ivory, with a rusty blend'. On the other hand, Wynne-Edwards described his Norber specimen as 'a fine deep red' (22), and Butcher (*loc. cit.*) writes of 'a very obvious red colour'.

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* In his copy of the 1st Edition of Baker's North Yorkshire (1) Lees inserted under *Orobanche rubra* 'above Carperby J.C. 1200' '. Miss Hartley has analysed Lees' annotations in this volume, and has informed me (*in litt.*, 14.1.69) that she is now sure that 'J.C.' refers to John Percival (of Carperby!?). In one case, *Juniperus communis* ('Moor edge above Carperby, J.C.'), a reference to J.C. corresponds with a record published by Lees (7, 8) and attributed by him to Percival. In each one of three other cases (including *O. rubra*) where Lees has written 'J.C.', the particular record concerned was subsequently attributed by Baker (2) to Percival.

It is clear that more precisely characterized descriptions of the colour forms of *Orobanche alba* are desirable and on the principle that there is no time like the present for making a start, the following description of the Carperby population has been prepared, on the basis of the R.H.S. Colour Chart (21). Since the colours in this chart are not given colour names, those of the stated equivalents in the earlier (24) Horticultural Colour Charts are given.

Stem: varying from pale Saffron Yellow (21.C) to pale Spinel Red (54.D), depending on the degree of development of suffusion with Chrysanthemum Crimson (185.A). *Corolla:* background colour pale/very pale Mimosa Yellow (8.C/D) veined by and suffused with Chrysanthemum Crimson to a varying degree. *Stigma:* just prior to opening of corolla, Chrysanthemum Crimson (185.A), deepening with age to Ruby Red (59.A).

TAXONOMIC DIFFERENCES BETWEEN *OROBANCHE ALBA* AND *O. MINOR*

Orobanche minor Smith, which is much the commonest British broomrape and decidedly catholic in its range of hosts, is nevertheless a distinctly rare plant in Yorkshire and is therefore likely to be unfamiliar to many Yorkshire botanists. This species is in cultivation in the Experimental Gardens of the Department of Botany in the University of Leeds and the opportunity has been taken to make a careful comparison between fresh material of this species and *O. alba*, since it became evident that the standard British Flora (4) was not very helpful for determination of *O. alba*. The key given for the genus fails to separate *O. alba* satisfactorily from *O. minor*. The character used, the point of insertion of the filaments above the corolla base, varies in the material studied from 1–2 mm. in *O. minor* and from 2–3 mm. in *O. alba*, but most often approximating to 2 mm. in both species. In any case, this is not a convenient character for use in the field when only a single spike is present, since it cannot be satisfactorily studied without removal of a flower. The characters italicized in the 'C.T. & W.' description of *O. alba* do not clearly distinguish it from *O. minor*, except by colour. The difference in the aspect of the stigma lobes (contiguous versus distant) is only readily appreciated when material of both species is available for comparative examination. Furthermore, the descriptions given of the curve of the corolla in the two species are particularly misleading. A reliable distinction does exist in the shape of the corolla tube, which in *O. alba* widens conspicuously all the way from the base, flaring widely at the mouth, in contrast to *O. minor* in which the corolla tube instead of expanding throughout is slightly *contracted* beyond the middle. A further evident distinction is that the flowers of *O. alba* are nearly always borne erect, not spreading as in *O. minor*. Both of these differences are clearly illustrated by Keble Martin (6). The colour distinction shown in corolla and stigma is very clear when the two species are seen together. The Chrysanthemum Crimson of *O. alba*, a purplish-crimson, is basically a red colour, but the purple of O. minor is a lilac-purple, or violaceous purple (close to shades of Amethyst Violet, e.g. 84.C), without any indication of a reddish hue.

INTERPRETATION OF THE 1968 DISCOVERY

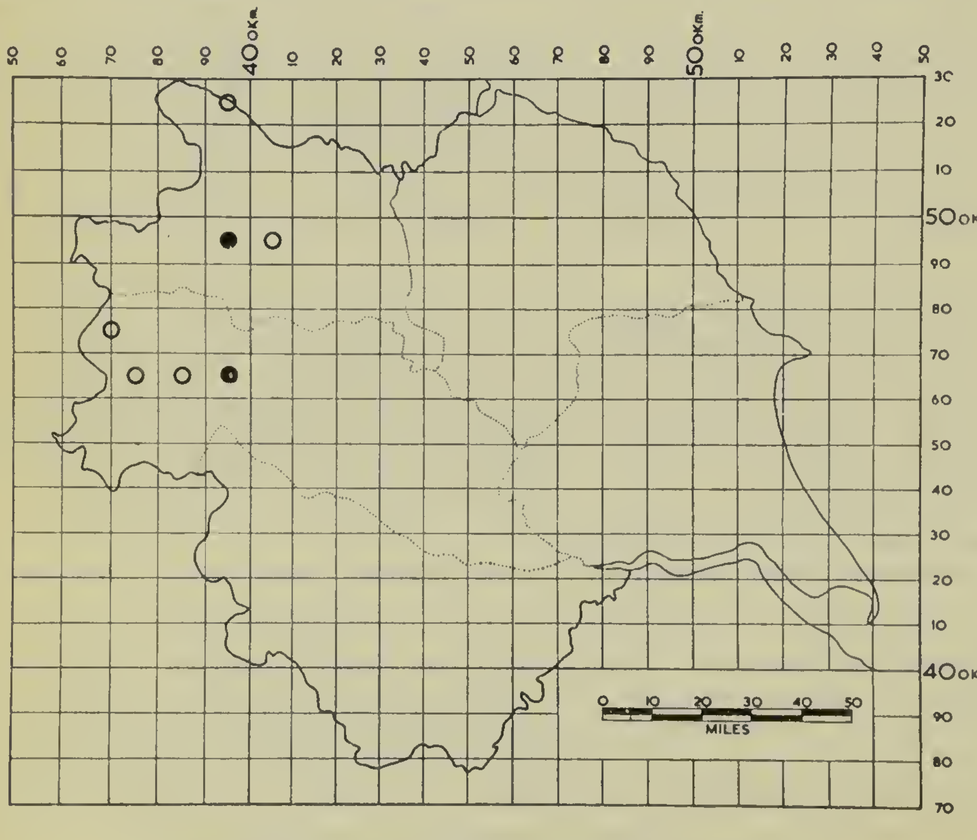
The question arises whether or not the flowering this year of *Orobanche alba* above Carperby was an exceptional event. This can only be really satisfactorily answered by systematic observation of the colony in future seasons, but the very size of the population suggests its permanence. Some traces were found of old flowering spikes from a previous season. There has not been opportunity to make a comprehensive search of the old Wensleydale localities. A visit by Dr. Sledge and myself to Nappa Scars failed to produce any *Orobanche*, while Leyburn Shawl (the classic locality and the one from whence came the last previous record in Wensleydale for *O. alba*) is now a totally unsuitable place for the plant, presumably because of lack of grazing, although expansion of the neighbouring quarry may well have also been a significant factor in the disappearance of the broomrape. Indeed, a brief visit failed to result in even a sight of the host species, let alone the broomrape. Subsequently, later in August, Dr. Sledge was able to examine parts of Preston and Redmire Scars but again without sign of the *Orobanche*. It is clear, therefore, that 1968 was not an *annus mirabilis* for *O. alba* in all of its old Wensleydale localities.

A basic difficulty in study of the distribution of species of *Orobanche* is that absence of inflorescences means that the plant cannot be found but it does not necessarily follow that the parasite is absent. We do not know how many seasons an *Orobanche* affecting a perennial plant can persist underground without flowering. The actual distribution of *O. alba* in Yorkshire may well be more widespread and less inconstant than its recorded flowerings suggest. It seems likely that the Yorkshire climate is marginal for the plant in that only rarely are conditions suitable for flowering. It has already been remarked that the Carperby station appears to be particularly well-favoured climatically and it may well be that this site is in consequence unusually favourable for flowering of *O. alba*.

The available indications thus suggest that *Orobanche alba* has persisted all along above Carperby and has escaped detection solely because the locality has not often been visited by botanists. It is perhaps significant that on the occasion of the discovery of this population, the possibility of encountering *O. alba* was entirely out of mind and in this sense the find was completely accidental.

It will be interesting to follow the development of the population in future seasons. I should be very glad to receive either directly or through the Editor of *The Naturalist*, spike counts and reports from the Carperby station, together with observations, negative or otherwise, from the other old Wensleydale localities. I would ask visitors to the locality not to remove spikes and to be careful not to damage the colony by trampling, otherwise not only may future observations on the population be prejudiced, but more importantly, the safety of the plant may be imperilled. (A voucher specimen has been prepared from the material taken for comparison with *O. minor* and has been deposited in the British Museum Herbarium).

Orobanche alba may well be perennial underground but for all anyone yet knows for certain, it might be monocarpic in habit in the marginally suitable conditions of Yorkshire, in which case seed-set would be vital to its continued existence. The proximity of old spikes to fresh inflorescences is not conclusive contrary evidence,



DISTRIBUTION OF *OROBANCHE ALBA* IN YORKSHIRE since seed-fall will usually be most dense near the parent spike. Furthermore it is probable that the broomrape has considerable difficulty in successfully achieving seed production in the Carperby locality. Certain molluscs, which may be slugs or else the *Cepaea nemoralis* snails whose empty shells are very frequent on the site, must be very partial to the flowers of the *Orobanche*, for a high proportion of flowers had had their ovary eaten away.

Some may doubt the wisdom of publication of this record. Careful consideration indicated that only two rational alternative courses of action were open; either detailed publication or complete suppression, since publication of any worthwhile amount of accurate ecological information regarding the habitat must make the site readily identifiable by any competent naturalist. The author would like to join the Editors of the *Atlas* (17, p. xxiv) in their belief that 'For both rare and local species . . . education and information will serve the ends of conservation better than secrecy and ignorance.' Only time can show if this belief will be justified.

EXPLANATION OF 10 KM. SQUARE DISTRIBUTION MAP

The distribution of *Orobanche alba* in Yorkshire as shown in the *Atlas* (17) is incomplete. A revised map is therefore presented here. The allocation of several records to their correct 10 km. squares remains uncertain and in consequence an analysis of the records is given below for the guidance of future map-revisers.

Mid-West Yorks. V.C. 64

34/67 or 77	Kingsdale, 1886 (=1888), Herb Lees — this record could equally well belong to either of these two squares, there being about the same amount of likely ground in both.
34/76	Norber, 1919, 'above Dear Bought Wood . . . before you come to the first erratic boulders' Wynne-Edwards (*loc. cit.*).
34/86	Attermire, 1811 (25).
34/96	Malham, 1953 (22); Coniston Cold, s.d. (12); Awes Scar, 1801 (12) — Mr. Frankland has confirmed (*in litt. ad.* W. A. Sledge, 16.12.68) that his 1953 record belongs to this square, and not to 34/86 as indicated in the *Atlas*.
34/97	The reference by Sledge (22) to a record 'of a single plant growing on Scar ledges at Kettlewell, towards Coniston' is based on 'scar ledges of Crookacre towards Conistone, 1 spn. 1908' (11). It has been assumed here that this locality is identical with 'Scar lynches over Conistone Cold' (12), which surely belongs to 34/96, but if these two records by Lees do not refer to the same station, then it is possible that the Crookacre plant was in fact found in 34/97. It all depends on how far south did Lees intend by 'towards'. (The record for 'scar lynches over Conistone Cold' is supported by an insertion 'Conistone scars!' in a copy of the *London Catalogue* which was marked and annotated by Lees principally but not exclusively as a 'Grassington Florula', and is now in the possession of Dr. Sledge. This marked *Catalogue* is clearly the basic source of a list (in which *Orobanche rubra* is included, p. 25) of the flora 'of Grass Wood and the environs from Grassington to Conistone, . . . ' compiled by Lees and published posthumously (10A)).

North-West Yorks. V.C. 65

34/99	Above Carperby, 1968; *ibid.*, 1884, Herb. Lees; Nappa Scars, s.d., (9).
35/92	Holwick, 'whin-sill exposures' (13) — this record could belong to 35/82 instead of this square.
44/09	Preston, s.d. (2); Leyburn Shawl, 1861 (1); *ibid.*, 1835, Herb. Ward (BM), etc.

ACKNOWLEDGEMENTS

I would like to record my warm gratitude to Miss M. M. Hartley, Mr. A. C. Jermy, Miss C. M. Rob, and Dr. W. A. Sledge for their invaluable help in tracing records and specimens of *Orobanche alba* and to Dr. Sledge again for his assistance in the field investigations.

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CHISLETT MEMORIAL LECTURE

The fourth Chislett Memorial Lecture was held in the University of Leeds Adult Education Centre, Middlesbrough, on Saturday, 8th March 1969, under the Chairmanship of Dr. Denis Summers-Smith.

Mr. Robert Spencer, Ringing Officer of the B.T.O. spoke on 'Progress and Prospects in Migration Research'. Much of our present knowledge has been gained by trapping and ringing which had made very large samples available for comparison. Careful weighing had shown that many birds gained considerable weight prior to migration and this fat enabled some birds to fly 50 hours without food or rest. It had recently been found that at least in some birds there was also an increase in muscle tissue. Radar studies by Dr. Lack and others had provided information concerning the volume of migration, particularly at night. It could also determine accurately the height at which birds migrated and the effect of weather. Most took place at heights below 5,000 ft. but some had been observed at heights up to 21,000 ft. Radar could not, however, determine species and Mr. Spencer expressed the opinion that Radar studies had passed the peak of their usefulness. The information provided by ringing was more precise. Mr. Spencer also described experiments with birds in a planetarium which showed that night flying migrants made use of the relative position of the stars. The lecture was illustrated by slides showing the information which had been gained from ringing such species as ring ouzel, lesser and common whitethroats and some of the ducks.

Dr. J. D. Pickup proposed a vote of thanks to Mr. Spencer which was carried with acclamation.

DOUGLAS WRIGHT.

THE BREEDING OF THE OYSTERCATCHER IN NORTH-WEST ENGLAND

M. E. GREENHALGH

The British population of the Oystercatcher (*Haematopus ostralegus*) has been described by Buxton (1961) and Dare (1966), the latter finding that it was in a phase of expansion in northern areas as a result of increasing protection and changing habits whilst in the south the breeding ranges were contracting into nature reserves and on islands, due to habitat destruction and disturbance.

Since 1963 I have made a study of this species in an area of north-west England including Lancashire, Westmorland and parts of W. Yorkshire and Cumberland. This has involved censuses of the breeding populations in the area and the collection of nest data. Some of the results from the Ribble Valley, which appears to be the most southerly river valley in England where breeding occurs regularly (Dare, 1965), have already been published (Greenhalgh, 1966).

Breeding Populations

Complete censuses were made in 1967 and 1968 along the coast between the Ribble Estuary, Lancashire and the Kent Estuary, Westmorland. Several other coastal

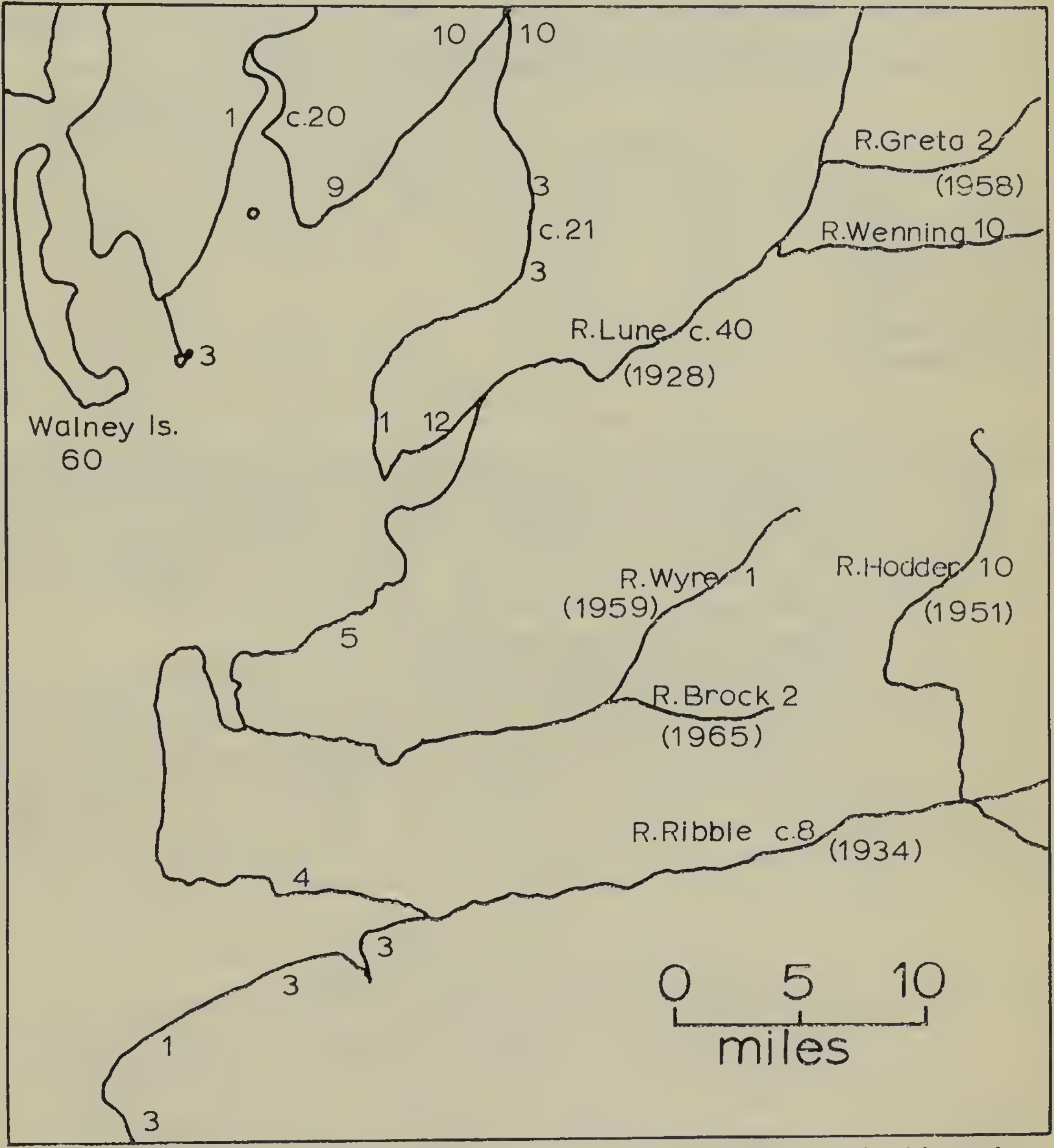

Fig. 1. Map showing the area of north-west England included in this study with the number of pairs of Oystercatchers marked. The year of first breeding on inland rivers is shown in parentheses.

sites in south-west Lancashire and the Furness District of Lancashire were also counted in at least one of the years since 1963. Complete censuses were made inland on the River Lune between Lancaster and Kirkby Lonsdale (1966–8) and the Ribble between Preston and the junction of the Ribble and Hodder (1963–8). Some stretches of these rivers were also counted in other years as were the Rivers Wyre, Brock, Hodder and some Lune tributaries. The results are summarised in Figure 1. Also is shown the date of first breeding on the rivers inland obtained from Buxton (1961) or personal observations.

The commonest coastal habitat in this area is saltmarsh and on some of the marshes high densities of Oystercatchers occur (Table 1). The Oystercatchers tend to nest on the outer edges of the marsh next to the high tide line, or by the sides of the wider channels which dissect the marshes. They seem to prefer areas of short, sparse grass, usually *Puccinellia maritima*, and may be attracted by the heavy grazing and deturfing which occurs on many marshes. They also nest on slag tips and railway embankments across the saltings in Morecambe Bay (Dare, 1966 and personal observations) probably as this affords protection from exceptionally high tides or perhaps because they like the bare stony surface to nest on.

TABLE 1

The Ostercatcher populations of saltmarshes between the Lune Estuary, Lancashire and the Kent Estuary, Westmorland in 1967–8.

	No. of pairs		Density (pairs/100 acres)
	1967	1968	
Colloway Marsh	13	12	2.3
Middleton Marsh	3	1	0.9–2.7
Hest Bank Marsh	6	5	1.2
Carnforth Marsh	20	21	2.5
Silverdale Marsh	3	4	0.9
Arnside Marsh	10	11	11.1
TOTAL	55	54	2.8

Elsewhere in the area coastal breeding habitats include the sand dunes of south Lancashire where only about five pairs nested in 1967 and four pairs in 1968 (they have been decreasing there due to disturbance), Walney Island where 50–60 pairs nest and along the open shore where there is little disturbance (for example, on parts of the Cumberland coast where I counted twelve pairs along two miles of beach in 1967). Smaller numbers breed on coastal arable fields.

The most typical inland Oystercatcher habitat is by the side of rivers. On the Ribble I have found a density of one pair for every two to four miles of river (Greenhalgh, 1966) and further observations since then have shown little change. On the Lune numbers appear to be increasing as can be seen by comparing the data of Dare and my own counts for 1966–8 (Table 2) and the summary of Buxton (1961). However, distribution is not even, there being high concentrations in some areas whilst only single pairs nest on other stretches of river. Stretches with highest Oystercatcher concentrations have generally large areas of shingle bank or island with little disturbance.

TABLE 2

The Oystercatcher population of the Lune Valley between Lancaster and Kirkby Lonsdale (14 miles) in four censuses.

	Number of pairs	Density (pairs/mile)	Source of data
1963	38	2.71	P. J. Dare
1966	40	2.85	This study
1967	47–51	3.35–3.63	—
1968	52–54	3.72–3.85	—

Most inland breeding Oystercatchers nest within a hundred yards of the river although this is not always the case. Odd pairs have attempted to nest as far as four miles from the Lune in meadows and pasture and by reservoirs in the Lune and Wyre valleys. These few pairs usually have little success.

BREEDING BIOLOGY

Breeding pairs appear in the coastal areas from late February or early March. It is often difficult to know when they pair due to the large wintering population which occurs in north-west England, with which the breeding population mixes. On the Inner Ribble Marshes, where there is no large winter population, some do not arrive already paired and pair formation takes place there.

The inland breeders, which are absent from the breeding areas throughout the winter, return at a similar time. Some return already paired but many do not, forming in pre-breeding assemblies of up to 150 in the breeding areas. It is not known how many of these pre-breeding assembly birds remain to breed in the area; some may be passage migrants which cross northern England in spring (Spencer & Greenhalgh, 1965). By mid-April pairing has taken place in the river valleys.

THE EGG STAGE

The nest site appears to be chosen and the scrape made up to two weeks before the eggs are laid and a great deal of time is spent, when the pair is not displaying or feeding, in the area of the nest-site.

The nest is simply a scrape in the ground made by the bird scratching with its bill and feet, and smoothed and shaped with the body. To this scrape may be added a lining of dry grass stems or small pebbles. Also I have found Rabbit droppings, cinders, feathers, and the flower heads of *Armeria maritima* and *Cochlearia officinalis* and the shells of Cockles (*Cardium edule*) lining the nest.

The first eggs are laid from the end of April or early May with a peak in the second half of May. My sample is too small for a comparison between the laying dates of the inland and coastal breeders. Laying of the first clutches continues to early June and replacements may be laid up to mid-June. I can find no significant difference in clutch size between the early and late nests.

The maximum number of eggs in a clutch has been four in this study though clutches of up to six have been found in north-west England (Robinson, 1935). Details of all clutches found in the study are shown in Table 3 together with those of Brown (1948) from the Cumberland Solway saltmarshes. There is no significant difference between the mean clutch sizes from the Solway and the inland and coastal areas of this study.

TABLE 3

Clutch sizes of Oystercatchers in north-west England.

	C/1	C/2	C/3	C/4	Mean
Inland	1	10	21	2	2.7
Coast	4	20	53	11	2.85
Solway	20	60	81	4	2.4

The data from the Solway Marshes are from Brown (1948).

The eggs are incubated for 25–27 days. In two accurately timed cases the hatching period was 45 hours and 37 hours at two different nests. Brief visits were made to these nests and the parents were kept away for no more than ten minutes so that the eggs and chicks were not chilled. During the incubation period many clutches and part-clutches are lost. The main single cause is flooding, either when a river is in spate or during periods of high spring tides, with human interference second. Whereas flooding may occur at any time throughout the incubation period, predation occurs mainly before the clutch is completed and incubation started. The figure for egg losses and hatching success in north-west England are given in Table 4.

TABLE 4

Hatching success and egg loss of Oystercatchers in north-west England, 1963–8.

Number of nests	Number of eggs	Number hatched	% eggs laid hatched
89	257	173	67%

The reasons for the loss of 84 eggs were:

Disappeared, predated or stolen by humans	39
Flooding	27
Destroyed by agricultural operations	9
Destroyed by sheep	4
Eggs cracked	2
No egg development	1
Dead embryo in shell	1
Chick died during hatching	1

Some eggs were seen to be taken by predators and 17 were definitely stolen by humans. Those which disappeared however, were probably taken by predators (gulls, crows, rats, foxes, etc.) or humans and therefore I have grouped the three together.

A remarkable cause for egg loss on saltmarshes was discovered in 1967. Several times I had found nests with eggs lying outside them. In every case the saltmarsh was grazed by sheep. In 1967 K. E. Hague visited Colloway Marsh and checked a nest which was surrounded by sheep with one egg rolled outside. All the eggs were wet and sticky with the saliva of sheep. Later I kept watch for sheep near Oystercatcher nests and twice found a similar thing. The sheep lick the eggs and one may be rolled out of the nest.

SURVIVAL OF YOUNG AND BREEDING SUCCESS

It is very difficult in many of the areas to count how many young a pair of Oystercatchers is raising and to make close observations on them. When disturbed the young either 'freeze' or run to cover and in both cases it is difficult to find them. However, with intensive watching close observations are often possible.

After hatching, the young may remain in the vicinity of the nest for up to two days during which time they may be brooded by the adults. They are then led from the nest. Those nesting on saltmarshes lead their young to the marsh edge or muddy channels where they are fed. Those nesting behind the shore in sand dunes or on fields may either lead their young to adjacent saltmarshes or the shore; or, if vegetation is very thick, leave them in the vicinity of the nest and bring food to them there. Inland nesting Oystercatchers take their young to the riverside or keep them in the neighbourhood of the nest until they are fledged.

The first indications that there are young present is the behaviour of the adults. When the young are approached the parents utter the piping distress call and fly round the observer. In some cases one of the birds may carry out some form of injury-feigning, shuffling along the ground with wings held half-open, trailing, and depressing the tail, showing the white rump. During this time it calls incessantly and when approached flies off.

Sometimes when the young are approached one of the birds will fly or run up to 50 yards from the nest and 'false brood' in a similar manner to when it has eggs in the nest. Some birds have done this even when their young have been almost fully fledged. If the young are caught for ringing or weighing the adult approach boldly, on one occasion to four yards, and when the young are released they usually run straight to their calling parents who escort them away.

Of the 51 nests in 1967–8 for which I have full data with definite evidence of the number of young fledged, 84 young hatched from 144 eggs, and 58 (40%) fledged, giving an average of 1.1 chicks per brood (Table 5). Nests with C/3 appeared to have higher hatching and fledging success than C/2, though the number of C/2 was too small for this to be significant. Other estimates of chick fledging success vary greatly: in Finland, Nordberg (1950) recorded a 78% success whilst Grosskopf (1964) recorded a 5% success in Germany. Recently Harris (1967) published estimates of chick fledging success from Skokholm of 37% (in 1963) and 59% (in 1964), an average production of 0.9 and 1.5 young per pair for those years respectively.

TABLE 5
Breeding success of 51 pairs of Oystercatchers in north-west England.

	No. nests	No. eggs	No. eggs hatched	% hatched	No. young fledged	% eggs giving fledged young
C/2	11	22	12	54	7	32
C/3	38	114	72	63	51	45
C/4	2	8	0	0	0	0
TOTAL	51	144	84	58.3	58	40

These data were obtained in the 1967–8 seasons when I tried to obtain as much fledging data as possible. Thus the hatching success is lower than that given in Table 4 due to the high percentage flooded by high tides and rivers in spate in 1967.

Many chicks disappear in the fledging period, presumably some having been killed off by bad weather. Some very small chicks may be drowned. Predators, mainly gulls and crows, take many chicks. One young was found dead in the middle of a Common Tern (*Sterna hirundo*) colony and from its injuries it seems probable that it had been killed by a tern.

The fledging period is 28–33 days. After this time the young remain with the adults in the breeding area, leaving inland sites from the end of July to September. Those on the coast join the increasing flocks of passage Oystercatchers or move away from the breeding areas.

ACKNOWLEDGEMENTS

I would like to thank especially Dr. P. J. Dare for help and guidance through my study of the Oystercatcher and Dr. D. W. Snow for helpful criticism of this paper. My thanks also go to those who have given me help in finding nests and discussion, especially K. E. Hague and J. Wilson.

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ISOPOD SURVEY SCHEME: RECORDERS ARE NEEDED

This scheme is intended, in the first instance, to give detailed information about the distribution and habitat preferences of terrestrial isopods (woodlice), and less detailed information about freshwater and marine species. Distribution maps will be produced in association with the Biological Records Centre of the Nature Conservancy at Monks Wood and the ecological information analysed and written up when sufficient data have accumulated.

A great deal of information is needed and it is hoped that many people will send in specimens and records, whether or not they have had previous experience of this neglected group of animals.

Further details and recording cards can be obtained from R. J. A. Metcalfe, Trinity and All Saints Colleges, Horsforth, Leeds, LS18 5HD.

R. J. A. METCALFE, P. T. HARDING, S. L. SUTTON.

FIELD NOTES

Lygus wagneri Remane (Hemiptera-Heteroptera) in Yorkshire

Species of the *Lygus pratensis* complex are attractive capsid bugs approximately 5–6 mm. in length. This difficult genus was reviewed by G. E. Woodroffe in 1966 ('The *Lygus pratensis* complex (Hem., Miridae) in Britain', *Entomologist*, **99** : 201–206). The occurrence of *L. pratensis* L. in Yorkshire, at Strensall Common, is commented upon by J. H. Flint in Yorkshire Naturalists' Union Annual Report for 1966 (*Nat.*, 1967, 17). There Flint states, "The older records of *L. pratensis* refer to the complex of species, now split up, of which *L. rugulipennis* Popp. is the most abundant and widespread and the only representative of the genus reliably known from Yorkshire before *L. pratensis* is evidently of very local distribution in the County".

Good numbers of a species closely resembling *L. pratensis* were found at Deep Gill near Hawnby on the occasion of the Union's visit on 16th June 1968, and these are referred to in the notes on entomology which I contributed to the report of the excursion (*Nat.*, 1968, 123). The specimens were subsequently sent to Mr. Woodroffe who kindly examined them and informs me that they are all *Lygus wagneri* Remane, a species first described in 1955 and not recorded before in Yorkshire. In his paper Woodroffe describes the distribution of *L. wagneri* as follows, "Open habitats — edges of arable fields, hedgesides, flowery banks, etc., as well as woodland rides in west and north, on various herbs, widely distributed and common; confined to forest rides in south-east, very local". No doubt future study will reveal this member of the complex to be more widely distributed in Yorkshire than the present single record suggests.

Roy Crossley

The parasitic copepod *Lernaea cyprinacea* L. in Yorkshire

The presence of the parasitic copepod *L. cyprinacea* in Britain, almost certainly as a recent import with cyprinid fishes brought from continental Europe, has recently been made known (Fryer, G., *J. Nat. Hist.* (1968) **2**: 531–3). In addition to reports whose authenticity I was unable to check, five cases have been recorded since 1966. Of these, four occurred in a relatively circumscribed area in south-east England, and the other, in south-west Wales, involved fishes which had been brought from Hertfordshire just before the parasite was found. Mr. A. Rennie has now sent me an egg-bearing female of *L. cyprinacea* found in July 1968 by Mr. I. Lambert on a goldfish (*Carassius auratus* (L.)) purchased in Pontefract, Yorkshire, and also several specimens from goldfish bought in Bradford. The purveyor of the Pontefract fish claimed to have forgotten its provenance but the Bradford fishes had been imported from Italy. The parasite has now been found sufficiently often to suggest that it may be established in Britain, at least in aquarium and ornamental pond conditions. Its range elsewhere suggests that, given the opportunity, it will be capable of tolerating natural conditions in this country where, as it is one of the most virulent of freshwater parasitic copepods, its presence can be regarded as undesirable. Illustrations which enable *L. cyprinacea* to be recognised are given in the paper quoted above. Information on any further records of this species, which is referred to in aquarium literature by the name 'anchor worm', will be welcome.

Geoffrey Fryer

A Method of Vegetative Propagation in the Bryophyte *Philonotis capillaris* Lindb

In July 1964, I collected a specimen of the moss *Philonotis capillaris* from a shaded crevice near Snowdon Waterfall. This material appeared to be somewhat unusual in possessing numerous small very easily detached branchlets. Subsequently I suggested (in *Trans. Br. Bryol. Soc.* 4, 5: 828 (1965)) that these branchlets could be propagula. In order to test this theory, I placed a number of the detached branchlets on cotton wool soaked in filtered soil water and enclosed in petri dishes. These were kept in daylight, but out of direct sunlight, during the period from 9th December, 1968 until 17th January, 1969. When the branchlets were examined on the latter date, it was found that new shoots and lengthy rhizoids had made their appearance from some of them. From the 17th January 1969 to 17th February 1969, the specimens have been examined at intervals and further growth and development has been observed which has involved more of the branchlets.

These observations therefore indicate the possibility of occasional natural vegetative dispersal of *Philonotis capillaris* by means of branchlet propagula.

This work was carried out at Nuneaton Technical College, Warwickshire.

J. H. Field.

THE PARASITIC COPEPOD *ERGASILUS SIEBOLDI* NORDMANN, NEW TO BRITAIN

GEOFFREY FRYER

Freshwater Biological Association, Ambleside, Westmorland

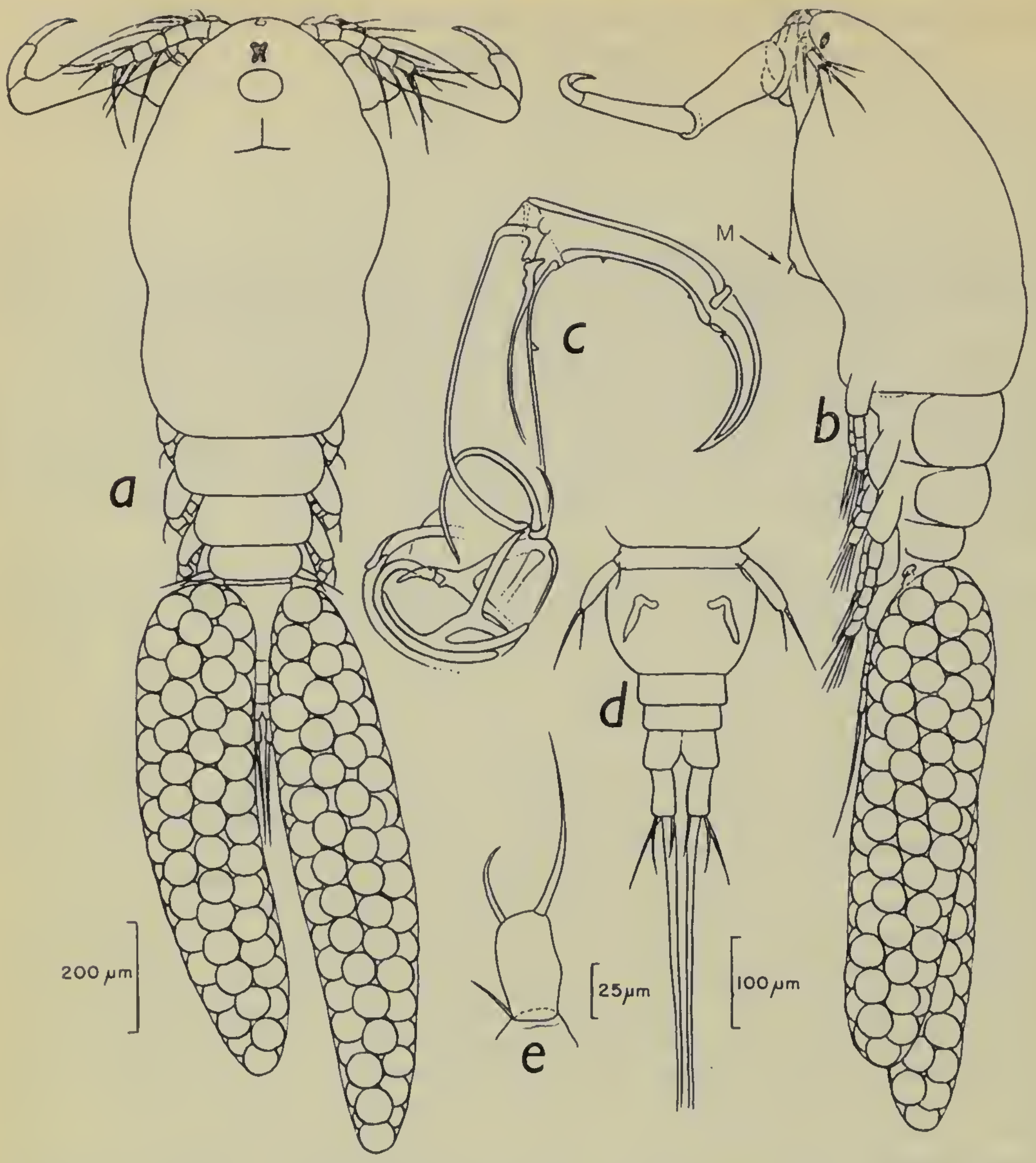
Although not hitherto recorded in Britain, the parasitic copepod *Ergasilus sieboldi* is common on many species of freshwater fishes in continental Europe. Because of this, and because he thought that it may either occur in this country and have escaped detection or be introduced in the future, Gurney (1933) included a description of it in his monograph of the British freshwater Copepoda. More than thirty years later Gurney's expectation was fulfilled when, in July 1967, Mr. R. G. Templeton of the Yorkshire Ouse and Hull River Authority found 12 dead Trout, *Salmo trutta* L, in the Howbrook Reservoir (Nat. Grid Ref. MR 330976) which lies between Sheffield and Barnsley, Yorkshire, and is in the Don drainage area. The gills of these were infested with parasitic copepods which he sent to me for examination and which proved to be *E. sieboldi*.

As Gurney's monograph — in which the illustration of *E. sieboldi* is borrowed from Markewitsch (1931) — is not readily available, and as British naturalists and anglers are seldom familiar with these parasites, the following notes and illustrations are presented in order to give some idea of the form and habits of this species. In essentials *E. sieboldi*, females of which are usually about 1 to 2 mm. in length, resembles a cyclopoid copepod in which the antennae (Fig. 1, *a–c*) have been modified for embracing the gill filaments of its host, to which organs it is confined, and in which the mouthparts have become specialised for the laceration of the gill tissues. When the parasite grasps the gill filament, to which its ventral surface is opposed, the mouth is brought against the host epithelium. The mandibles can sometimes be detected in individuals viewed laterally (Fig. 1 *b*, M). It is only recently that accurate information on its feeding habits has been obtained (Einszporn 1965) and, because of the difficulty of observing living animals *in situ*, the mechanism of food collection is still incompletely understood. Always the parasite is attached with its head directed towards the base of the gill filament, and it is only females which so attach themselves. These produce *Cyclops*-like egg sacs. The males are free-swimming, survive as adults for a much shorter period of time than the females, and are therefore much less frequently seen. They naturally lack the adaptations for a parasitic way of life shown by the females. Larval development is basically similar to that of cyclopoid copepods.

The only point of anatomy that calls for comment concerns the fifth pair of legs. These, which are shown in Fig. 1, *d* and *e*, are generally described as being composed of one segment. This, however, is arguable for close inspection shows that they in fact arise, not directly from the fifth somite, but from a minute pedicel which should perhaps be regarded as representing a much reduced basal segment. Such is the case also in certain non-European species of the genus. The apparent shape of the fifth leg differs, according to the angle at which it happens to be lying, as can be seen by comparing the right and left legs in Fig. 1, *d*, and particularly by comparing the shape as it appears in this view with that revealed when, as in Fig. 1, *e*, the limb is seen in face view.

Markewitsch (1931), who described the anatomy of *E. sieboldi* in considerable detail refers to and figures two terminal setae and a basal seta. Gurney (1933), who paid meticulous attention to detail and who is renowned for the supreme accuracy of his illustrations, shows only two terminal setae. His meticulous nature is shown by the fact that, although he used Markewitsch's illustration of the whole animal, on which leg 5 appears as a minute structure, he nevertheless removed the basal seta, being presumably convinced that it did not exist. Examination of the present material at first suggested that Gurney was correct, but very careful examination with an oil immersion lens usually succeeded in revealing the basal seta, and in individuals whose leg is suitably orientated the seta is in fact clearly apparent (Fig. 1, *e*). It is, however, delicate and cannot always be found, though this may be the result of inevitable rough handling during dissection. This seta arises from the minute basal pedicel.

Infestations of *E. sieboldi* are sometimes heavy. Schäperclaus (1954) mentions a Tench, *Tinca tinca* (L), 36 cm. in length, with about 3,100 individuals on its gills, and Gurney cites Neuhaus who found 3,000 specimens on a Tench only 25 cm. in



Ergasilus sieboldi. *a.* Adult female, dorsal. *b.* The same, lateral. (The right antenna, which can be brought into focus by deep focussing, is omitted for clarity.) *c.* Antenna. Note the complex chitinous skeleton basally which serves for the insertion of an equally complex muscular system and also permits articulation of the segments involved. Note also the minute protuberances on the penultimate and ante-penultimate segments which enhance the efficiency of the grasping appendage. *d.* Posterior region of the body, ventral, to show the fifth pair of legs, the genital somite, abdomen and furcal rami. *e.* Leg, 5, face view.

Legend: M = Mandible.

length. As a result of the destruction of the gill tissues, withdrawal of blood, particularly leucocytes which have migrated to the seat of damage (Einszporn 1965), and the frequent bacterial and fungal infection of the wounds inflicted, less heavy infestations that this can lead to the death of the host. This parasite is therefore a highly undesirable inhabitant of fish ponds or other heavily stocked waters where the chances of re-infection are particularly high. Non-fatal infestations also influence the condition of the host, and Schäperclaus (1954) shows how the condition factor of the Tench is inversely related to the number of *E. sieboldi* carried.

Only detached gills from one of the infected Trout from Howbrook Reservoir were available. This specimen, 6.5 inches (*c* 16.5 cm.) in length, carried over 130 parasites on six incomplete sets of gill filaments. As numerous additional specimens had been detached, the total infestation was probably as high as 200 parasites — which is a considerable number for such a small fish. Sometimes two parasites were present on a single gill filament.

The infected Howbrook fishes were apparently part of a batch of Brown Trout which had been introduced to the reservoir about six weeks previously, when they were presumably free from infection. If this be so, then the infestation must have built up quickly, which suggests a large population of parasites in the reservoir. The period of maximum reproduction is usually during the warmest part of the year — which is when the fishes were introduced. As yet no information is available to show that other species of fishes in the reservoir are infected, though this is presumably the case.

I am grateful to Mr. R. G. Templeton, the discoverer of *E. sieboldi* in Britain, for providing me with material through the good offices of Messrs. I. Lambert and J. Robinson.

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A MIGRATION OF SYRPHID FLIES AT SPURN

S. L. SUTTON

Department of Zoology, University of Leeds

Reports of Syrphid migration appear in the entomological press from time to time, but as yet insufficient information is available to establish any migratory pattern in the British Isles or to provide answers to questions about methods of navigation and orientation. The following account of a well-defined southerly movement at Spurn Point, Yorkshire, between 20–22nd August 1968 is given in the hope of stimulating local interest and study in these much-neglected problems of insect migration.

I was informed of the migration by the Warden of Spurn Bird Observatory and was able to spend the whole of the 22nd investigating, in warm and sunny weather. The movement was characterised by abnormal numbers of Syrphids in the area and by visible migration southwards along the peninsula. To determine numbers of species and individuals in the Warren area, random sweeps over flowers were made with a net, and this was supplemented by a collection made the day before by the ornithologists. To estimate the numbers migrating I sat at the Narrows half way down the peninsula where the high tide marks are barely 35 yards apart, and here I made a half-hour count of the number passing overhead. A number of the migrants were caught and checks were made throughout the day to establish the duration of the movement. To determine the flight-path, observations were made at intervals along the peninsula and at the Point.

Since one sweep of the net over flowers could produce several hundred Syrphids, this line of enquiry produced an embarrassing amount of material. No attempt was made to hunt down unusual species and probably the variety present was far greater than that shown in Table 1, which lists the species taken by sweeping. It was estimated that on the ragwort blossom there was about one Syrphid on each floret, and that on a medium-sized ragwort plant there were approximately 200–300 of these flies. All the Syrphids are common species in northern Britain and have occurred before at Spurn. The absence of *Volucella* species was rather surprising.

TABLE I
Syrphids taken by sweeping flowers at the Warren, Spurn, on 22.8.68.

Species	Number caught	Species	Number caught
Syrphus balteatus	21	*Eristalis tenax*	3
Scaeva pyrastri	11	*Melanostoma mellinum*	2
Sphaerophoria scripta	7	*Syrphus ribesii*	2
Eristalis arbustorum	6	*Helophilus pendulus*	2
Syrphus latisfasciatus	5	*Syritta pipiens*	2
Platychirus clypeatus	4	*Syrphus vitripennis*	1
Syrphus luniger	4	*S. corollae*	1
Melanostoma scalare	3		

TABLE 2
Syrphids caught in the flight-path at the Narrows, Spurn, on 22.8.68.

Melanostoma mellinum
Sphaerophoria scripta
Scaeva pyrastri
Syrphus ribesii
S. luniger
S. balteatus
Eristalis tenax
Helophilus pendulus

Table 2 gives a list of species observed migrating at the Narrows, where they were found in approximately the same order of abundance as that shown in Table 1. Certainly *Syrphus balteatus* and *Scaeva pyrastri* dominated the flight. Some of the smaller Syrphids were probably missed. The sawflies *Selandria serva* (F.) and *Tenthredo acerrima* Benson were also taken and small numbers of bumble bees and Pierid butterflies appeared to be on the move. The involvement of small numbers of bumble bees in the migrations of other insects has been noted before (Rothschild, 1956). Flight at the Narrows was rapid and sustained, but numbers stopped and settled around me as I sat in the flight-path. The wind was southerly or south-easterly at this point, Force 3, and the flies were moving just in the lee of the dunes along the Humber shore in a column no more than 3 to 4 yards wide. The movement was not visible from the road, but was very apparent when viewed from a sitting position below the bank, where I was able to estimate the numbers passing me, silhouetted against the sky. Between 1130 hours and noon I calculated the rate of passage as between 100 and 200 a minute over a six foot front to one side of me as I sat facing into the flight, and as I was sitting in the middle of the flight-path the total number was probably double this. Movement continued at this rate through the early afternoon, but had slackened considerably by 1600 hours. The day before, by all accounts, the flight had been much more substantial with 'plagues of wasps' at the Warren and obvious movement along the road at the Narrows (however this latter feature was due, at least in part, to the lack of wind that day, which allowed the Syrphids to fly higher, along the road surface, where they were more noticeable).

Although basically a southerly movement along the peninsula, it was clear that the Syrphids were influenced by topography and were in fact coasting down the sheltered side of the dunes, this involving a substantial change of heading from south-east at the Warren, to south-west at the Narrows and then back to south-east at the Lifeboat station. On the southernmost tip of Spurn I noted individuals setting off on a broad front south and south-east into the wind. These made slow progress, flying low over the water, as is their custom in a strong head wind. Mortality was probably high, although no bodies were noted on the water line. Mortality on land was considerable, with dead Syrphids strewn along the flight-path and drifted into little heaps by the wind.

DISCUSSION

The migration outlined above is a carbon copy of one which occurred at Spurn in 1955 (Owen, 1956) involving the same species and agreeing even in such details as the presence of ab. *unicolor* of *Scaeva pyrastri*. The only major difference was that the wind was then westerly rather than southerly and the flight-path was along the North Sea shore (i.e. again in the lee). Passage at the Narrows was estimated at 500 per minute across a six foot front. Once more large numbers of dead bodies were found in the flight-path. This report also mentions southerly movements of Syrphids at Spurn in previous years, notably in 1949 and 1950 and it may well be that a southerly movement in the autumn is an annual event, but one that is only recorded when migrants and entomologists encounter one another.

The narrow and well-defined flight-path following the curve of the dunes from the Warren to the Point clearly indicates that the flies at this stage were strongly influenced in their flight direction by topography. However, the fact that on reaching the southernmost tip of Spurn they set off across the sea with no landmarks in view (the Lincoln coast was obscured by haze) shows that topography had ceased to be the dominant influence and that another navigational aid was used thereafter. The most likely aids would be the sun's position or wind direction, and in connection with the latter it may be significant that the animals set off head into the wind. It may be noted that some insects (e.g. locusts) are known to orientate into the wind when flying under experimental conditions, but for active migrants such as Dragonflies, the larger Lepidoptera and Syrphids, field observations suggest that movements can take place irrespective of wind conditions, providing it is not so strong as to inhibit flight altogether. (It is interesting to note that Pierid butterflies were moving south in small numbers at the Narrows, but being rather weak fliers, were unable to progress against the head wind at the Point and steadily accumulated during the day in the Point area.) Orientation to the sun has often been suspected as the major element in the navigation of migrating insects, but many people have found it difficult to accept that an insect has a 'clock' with which to compensate for the movement of the sun in order to maintain a constant compass heading. A clock mechanism has been shown to occur in bees (von Frisch, 1967) but recently Baker (1968) had put forward evidence that Pierid Butterflies possess no clock and simply fly at a fixed angle to the sun, so that their compass flight direction changes during the day. This crude but simple method of navigation gives rise to a flight-path consisting of a series of daily arcs as the insect changes heading with the changing azimuth angle* of the sun. However, the effect is minimised in these butterflies by limitation of the flight period to the middle of the day. It may well be that Syrphids can navigate in the same way. It would be particularly valuable to know if the flight direction out to sea at Spurn changes with the azimuth angle of the sun, as would be expected if the fixed angle theory applied in this case. All that is needed is a sharp eye and a compass.

*azimuth angle — the compass heading shown by the sun (cf. the angle of elevation).

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THE GEOLOGY OF ILKLEY MOOR

PHILIP LAMMING

This paper forms part of the survey of Ilkley Moor which has been carried out by the Wharfedale Naturalists' Society over the past ten years.

The north facing slope of Rombalds Moor within the Ilkley U.D. boundary is composed of a series of beds of sandstone and shale largely covered by the debris resulting from their weathering, both chemical and mechanical; in addition boulder clay and gravels of glacial origin are present. The solid rocks are of Millstone Grit (Namurian) age; the lowest mapped being in the H goniatite zone and the highest in the R2 zone (Stephens *et al.*, 1953). In the area immediately to the south of the town marine rocks are recorded at four points only (Stephens *et al.*, 1942) and to these may be added a fifth found during the present survey. This occurs in Spicey Gill, upstream from the road bridge on the Keighley Gate road (110467). The band consists of thin (approx. 1″) bullions containing a variety of fossils, including goniatites, in an uncrushed state. The band is very thin, possibly no more than two inches, and the bullions, which are completely decalcified, occur within a dark gritty rock. Other rocks in the area are fossiliferous only to the extent of the usual plant remains.

Lithologically these rocks vary in grain size from coarse grits with occasional layers of pebbles of white quartz to sediments of the finest grade, with at least one thin limy band (Backstone Beck). The grits are often remarkable for their coarseness of grain size and for the freshness and abundance of the fragments of feldspar which frequently show bright cleavage surfaces. The minerals of which the grits are composed show that the rock was derived from some pre-existing granitic or gneissic mass, yet only rarely are pebbles of the original rock found within it and these are small. The finer sediments grade down to clayey rocks and all gradations can be seen in the banks of the deeper cut becks. In Backstone Beck the cyclic nature of the sediments can be seen; each cycle showing an upward transition in grain size from fine to coarse. The sandier beds of each cycle stand out slightly from the surface of the cliff. The thick sandstones, by reason of their hardness, form the cliff scarps on the moor side while the softer intervening shales are much obscured and form the less steep 'treads' between the 'steps'. It may perhaps be mentioned that the brown colour of the sandstone is due to the weathering of iron minerals. The same rock when brought up from depth, as in a borehole core, is light greenish grey in colour and contains pyrites and iron-bearing carbonates.

The general dip of the beds is to the south so that the exposed face is also the strike. This factor has contributed to the greater gradient of the south bank of the valley compared with the north, and to the formation of the conspicuous crags. No doubt at the end of the last glaciation this part of the valley would be over-steepened and on the melting of the supporting ice, land slips on a grand scale would occur. Land slipped masses are evident over the whole length of our area and the lower slopes are covered with the hummocky boulder-strewn debris. One notable slip can be seen behind White Wells where there is a great embayment in the escarpment and below, a large apron of debris. Rocky Valley represents a slip of a different form. Here a mass appears to have slipped down on a curved plane parallel with the edge of the scarp. The curvature of the slip plane has caused rotation of the slipped beds such that their dip into the hillside is greatly increased. A similar effect can be seen in beds forming the banks to Backstone Beck above the Highfield road.

Faults are common in the area and many of the scarp edges are cut and stepped by them. The area of grit behind the Cow and Calf is bounded by faults on two sides, and at the head of Backstone Beck the plane of movement of one is admirably displayed. In this case it is a transverse fault as the striations on the surface show.

The boulder clay and gravels are poorly exposed, as is to be expected, but they are seen in some of the becks and on the moor top where in the past they have been a source of limestone for burning. All the erratics are of fairly local derivation and though limestone boulders are rare they can be found if search be made.

In the course of the survey three localities were demonstrated at which base-loving plants grew. Two of these were plainly on slipped terrain and the source of the bases therefore is hard to establish. In general the rocks of the moor should give acid soils. However, the possible presence of pockets of limestone erratics might account for local basic conditions. It might also be remembered that carbonates occur in unweathered grit (Butterfield, 1934) and that these might be carried to the surface by springs to give an area of reduced acidity. At the third locality, in Spicey Gill, the rocks are *in situ* and a search was made for a limestone band similar to that in Backstone Beck. The result, as mentioned above, was the finding of a band of decalcified bullions which, insofar as the decalcification may not be complete, would constitute a source for alkalies in the water which issues from the rock face.

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THE LEPIDOPTERA OF YORKSHIRE

(*continued from* 1968, *p.* 104)

Lythria purpuraria Linn. (Purple-barred Yellow).
Not recorded in Yorkshire, or for that matter anywhere else in Britain in the twentieth century.

Rhodometra sacraria Linn. (Vestal).
This was first found in the county when S. Crooks took a specimen at M.V. light at Baildon (64) on 31st August 1961; he took a second on 19th September 1961.

Ortholitha bipunctaria Schiff. (Chalk Carpet).
Confined to a few chalk districts near the east coast where it is sometimes plentiful.
61. Filey district.
62. Scarborough district; Cayton Bay, on calcareous clay cliff.

O. moeniata Scop. (Fortified Carpet).
It is a hundred years since this species was last taken in Britain, that specimen being taken near York.

O. mucronata Scop. (Lead Belle).
This old species has recently been split into three and our records do not permit us to distinguish between them. On the assumption that most, if not all, Yorkshire specimens are in fact *O. mucronata* it can be said to be well distributed in the county wherever there is plenty of Gorse.

O. chenopodiata Linn. (Shaded Broad-bar).
Well distributed and often common on railway embankments and dry grassy slopes; a dark form occurs on the Wolds (61).

Larentia clavaria Haw. (Mallow).
Recorded from a number of widely separated areas; it does not stray far from its food-plant and may not be recorded unless searched for.
62. Larvae at Runswick Bay and Seamer in 1918.
63. Shipley.
64. Harrogate, 1951; Selby, frequently at light.

Orthonama lignata Hubn. (Oblique Carpet).
Very local but there are two well-established colonies and a few odd records besides.
61. Barlby, once; Skipwith Common, well established.
64. Askham Bog, often common; Selby, 1933.

Venusia cambrica Curt. (Welsh Wave).
Local in hilly districts, provided always that its food-plant, the Mountain Ash, is available.
62. Scarborough district.
63. Hardcastle Crags, 1955; Sheffield.
64. Grassington; Harrogate, once; Malham; Pateley Bridge, 1919; Sedbergh, 1927.

Oporina filigrammaria H.S. (Small Autumnal Carpet).
Widespread in the higher moorland areas.
63. Denholm; Halifax; Meltham; Sheffield, on the moors.
64. Harrogate.
65. Richmond district.

O. autumnata Borkh. (Autumnal Moth).
Probably more widely distributed than the records suggest because it is frequently confused with *O. dilutata*.
62. Hutton-le-hole, larvae in 1937 on a Y.N.U. field meeting.
63. Sheffield, frequent.
64. Grassington.

(*O. chrystii* Prout (Pale November Moth).
We have no record for this species, presumably because it is difficult to distinguish from *O. dilutata*. It certainly would be expected to occur.)

O. dilutata Schiff. (November Moth).
This insect is widely distributed and often common.

Asthena albulata Hufn. (Small White Wave).
A very local species but the shortage of records is surprising as though small this moth is not inconspicuous even in daylight.
61. Cliffe Common.

62. Langdale End; Pickering.
64. Bishop Wood, scarce; Grassington, 1927 but not since.

Discoloxia blomeri Curt. (Blomer's Rivulet).

Very local and apparently now confined to the North-east of the county although there is an old record from Knaresborough (64).

62. Cayton Bay; Helmsley, 1932; Loftus, 1905; Scarborough, well-established in Forge Valley.

Hydrelia testaceata Don. (Waved Carpet).

Very local and probably no longer occurs in Yorkshire. The best known locality in Porritt's time was Edlington Wood (63) where it was common. It was last recorded there in 1909 and has not been reported in the county since.

H. flammeolaria Hufn. (Small Yellow Wave).

A very local little moth but it is still quite widespread.

61. Allerthorpe.
62. Pickering; Scarborough, in Forge Valley.
63. Edlington Wood, frequent in 1935 and in 1966 on a Y.N.U. field meeting; Wentbridge.
64. Bishop Wood.

Euchoeca nebulata Scop. (Dingy Shell).

Local in damp woods, probably more widely distributed than the records suggest.

62. Sand Hutton, 1933.
63. Wakefield.
64. Askham Bog; Bishop Wood, scarce; Bramham Park; Selby district.

Operophtera fagata Scharf. (Northern Winter Moth).

Common and widely distributed wherever there is an abundant growth of Birch.

O. brumata Linn. (Winter Moth).

Generally common and very widely distributed, it is sometimes so abundant as to be destructive.

Pelurga comitata Linn. (Dark Spinach).

Not common, but recorded sporadically from widely separated districts.

61. Barlby, one in 1968; Kilnsea in 1949; Filey, 1967; Selby, formerly common.
62. Strensall, 3rd August, 1958.
63. Bradford; Otley, 1942; Saltaire; Shipley.
64. Leeds, 1959; Sedburgh, 1927.

Entephria caesiata Schiff. (Grey Mountain Carpet).

Widespread on high moorlands, most records are from the Pennines but one from Scarborough suggests that it must also occur on the North Yorkshire Moors.

62. Scarborough.
63. Denholm.
64. Brimham Rocks; Denton Moors; Grassington; Ilkley Moors.

E. flavicinctata Hubn. (Yellow Ringed Carpet).

There is one well-known locality where this local moth is really well established but records from two other areas would be worth following up.

62. Scarborough, there is an old record but nothing recent.
64. Grassington, usually abundant in the valley at the foot of Dib Scar; Oughtershaw in Langstrothdale.

Epirrhoe galiata Hubn. (Galium Carpet).

Although local and not generally common it has been recoreded from widely separated areas. It is well established on the limestone at Grassington (64) but rather surprisingly it has not been reported from the Pickering and Scarborough area (62).

61. Kilnsea.
63. Halifax; Huddersfield; Sheffield, rare; Wakefield, 1946.
64. Burley; Grassington, not uncommon on the limestone pavements; Harrogate, one, 30th June 1961; Knaresborough, one, 30th June 1956; Bentham, on a Y.N.U. visit in 1935.

E. rivata Hubn. (Wood Carpet).

There are no records since the Second World War but several from the period between the wars. Although not easily distinguished from the next species its presence in the county should be reconfirmed.

63. Doncaster, in Wheatley Wood in the 1930's but the wood has since been felled and built on; Edlington and Wadworth Woods, about 1919; Huddersfield district about 1923.

E. alternata Mull. (Common Carpet).
Well distributed and often common, particularly where there is plenty of Bedstraw. ab. *pseudo-rivata* was taken at Thixendale (61) on 30th July 1965.

E. tristata Linn. (Small Argent-and-sable).
Local on high moorlands, particularly along the borders of woods.
62. Levisham.
63. Chevet near Wakefield; Deffer Wood, common; Denton.
64. Dallowgill Moors.

Euphyia unangulata Haw. (Sharp-angled Carpet).
There are no recent records and it is quite possible that early records were erroneous, the last two were in the first decade of the twentieth century: Everingham (61) and Bolton Woods (64).

E. bilineata Linn. (Yellow Shell).
Generally distributed and often common, even in gardens and urban areas. It does not always enter M.V. traps in any numbers so that its presence may not be established by this means.

E. rubidata Fabr. (Ruddy Carpet).
Not recorded since Porritt's List.

E. polygrammata Borkh. (Many Lined).
Not recorded since Porritt's List.

Eulype hastata Linn. (Argent and Sable).
A very local insect, not often recorded since the war.
62. Pilmoor, 1948; Strensall, 1955.
63. Deffer Wood, 1953; Kirkburton, 1940, on a Y.N.U. meeting; Wadworth Wood, 1958; Wakefield, 1918 and 1946.
64. Askham Bog, 1950; Bishop Wood, frequently in recent years; Bolton Percy, 1943; Temple Newsam, 1944.

Mesoleuca albicillata Linn. (Beautiful Carpet).
Fairly well distributed in the larger woods.
61. Selby district; Skipwith Common.
62. Buttercrambe Wood; Pickering; Robin Hoods Bay, 1946; Thornton-le-dale, 7th June 1953.
64. Bishop Wood, frequent; Grassington, frequent; Selby district.

Lyncometra ocellata Linn. (Purple Bar).
Widely distributed but not common.
61. Skipwith Common; Spurn.
62. Scarborough.
63. Halifax.
64. Burley Woodhead; Colsterdale, 1958, at a Y.N.U. meeting; Grassington; Harrogate.

Plemyria bicolorata Hufn. (Blue-bordered Carpet).
A local insect which is not often recorded except in one or two districts.
61. Skipwith Common, up till about 1955.
62. Pilmoor, 12th August 1968.
63. Flocton, 1939.
64. Askham Bog, common; Bishop Wood, up to 1955; Copgrove, 1959; Harrogate, uncommon.

Perizoma affinitata Steph. (Rivulet).
A local insect, but sometimes common where it occurs.
61. Filey, 1966 and 1967.
62. Pickering; Scarborough, in Forge Valley.
63. Skelmanthorpe, 1924.
64. Harrogate; Knaresborough; Malham.
65. Richmond.

P. alchemillata Linn. (Small Rivulet).
Much commoner than the last species and with a more general distribution.
61. Filey; Selby area; Skipwith Common.
63. Bradford; Halifax; Normanton, 1910.
64. Askham Bog; Grassington; Harrogate; Knaresborough; Selby area.

P. flavofasciata Thunb. (Sandy Carpet).
Rather local but not uncommon, its distribution is restricted to areas where the food-plant *Lychnis dioica* (Red Campion) grows freely.
61. Selby district; Skipwith Common.

63. Bradford; Halifax; Wakefield.
64. Far Headingley; Harrogate; Knaresborough; Selby area.

P. albulata Schiff. (Grass Rivulet).

Restricted to localities in which the food-plant *Rhinanthus crista-galli* (Yellow Rattle) grows in plenty but in such places it is often common.

61. Kilnsea; Selby District.
62. Scarborough; Strensall Common.
63. Bradford; Huddersfield.
64. Harrogate; Malham, 1910; Micklefield; Leeds, 1956.

P. bifasciata Haw. (Barred Rivulet).

Only two localities have been reported, in both of these it is well established. There seems little doubt that it would be found in other districts in which the food-plant *Odontites verna* (Red Bartsia) grows freely; it is usually taken as a larva in the autumn rather than as a moth when on the wing.

61. Kilnsea, August 1949, a single specimen taken at light by H. N. Michaelis was a new Yorkshire record. The larvae have been common in the district in recent years.
62. Scarborough, larvae plentiful in 1959.

P. minorata Treits. (Heath Rivulet).

The only known locality in the county is at Grassington (64) where it is sometimes abundant on the grassy slopes above Dib Scar; even there however it is extremely localised and of very erratic appearance.

P. taeniata Steph. (Barred Carpet).

This species too has only one known locality in the county, only a few hundred yards from the last species. It inhabits the boulder-strewn valley below Dib Scar (64) where it is generally scarce and difficult to find.

Hydriomena furcata Thunb. (July Highflier).

Widely distributed in woods and on commons and heaths and often very common. A small race feeding on Bilberry occurs on most of the higher moors.

H. coerulata Fabr. (May Highflier).

Fairly widespread and often common where there is plenty of Alder.

61. Filey; Selby district; Skipwith Common.
62. Hutton-le-hole; Thornton Dale.
63. Horbury, 1925.
64. Askham Bog; Harrogate; Washburndale, 1939.

H. ruberata Frey. (Ruddy Highflier).

Local and not often recorded, it may sometimes be mistaken for a large specimen of the previous species.

61. Skipwith Common, larvae regularly.
62. York district, in the 1940's and one in 1964.
63. Doncaster.
64. Harrogate, one 28th May 1964.

Earophila badiata Hubn. (Shoulder Stripe).

Now somewhat localised but still widespread and not uncommon, mainly in areas of scrub and overgrown hedges where there is plenty of wild rose.

Coenotephria berberata Schiff. (Barberry Carpet).

Not recorded since Porritt's List.

C. derivata Schiff. (Streamer).

Presumably restricted in range by the availability of the food-plant, the wild rose, but it cannot surely be as uncommon as the available records suggest.

61. Cliffe Common; Filey.
64. Bishop Wood; Grassington; Harrogate; Knaresborough; Malham, 1911.

Nyctosia obstipata Fabr. (Gem).

This little migrant does not often venture so far North but there are quite a number of records in the last twenty years.

61. Muston near Filey, one in 1966.
63. Dalton, one, 31st July 1950 and one, 3rd August 1950; Sheffield, September 1949; Triangle near Halifax, 16th October 1959.
64. Harrogate, one, 12th August 1959 and one 23rd October 1960; Selby, one, 15th September 1947.

(*to be continued*)

FRANCIS CAVERS, D.Sc., F.L.S. (1876–1936)

G. A. SHAW

Although it is rather late in the day to be writing what is in effect an obituary notice some thirty years after his decease and some sixty years after the cessation of his association with Yorkshire, I feel that some memorial should be written to commemorate the late Francis Cavers, former bryologist. From 1901 to 1903 Cavers was Assistant Lecturer in Biology at the Yorkshire College, Leeds. During this period (and up to 1907) he published some important papers on the Hepaticae in *The Naturalist*. At the time of his death in 1936, Cavers had been away from Yorkshire for some thirty years and no obituary notice appeared in *The Naturalist*. It is in an attempt to remedy this deficiency that this paper has been written.

The name of F. Cavers is known to botanists chiefly for his paper 'On the Structure and Biology of *Fegatella conica*', published in *Annals of Botany*, Vol. XVIII, Jan. 1904, and for his monumental paper 'The Inter-Relationships of the Bryophyta', in *New Phytologist*, Vol. IX (1910) and Vol. X (1911). Although obituary notices appeared in *Nature*, 20 June 1936, in *Chronica Botanica*, Vol. 3, 1937, and in *Annales Bryologici*, Vol. 9, 1936, these have no details of his earliest years beyond the fact that he was born in Hawick in 1876. All the obituaries speak of his quiet, unaffected manner and great personal charm, his devotion to his work and his eagerness to encourage young research workers. The only personal notes I am able to add are the recollections of a former student of Cavers' in the years 1910–11 (Miss F. M. Loader, of Southampton) who writes: 'Of course, I remember Professor Frank Cavers very well — he was at the old Hartley University College when I was first a student — only for one year 1910–11 — then naturally I was young and in those days there was an appropriate respect on the part of young students for the Professor so I did not know him intimately. I have no idea how long he was in the Chair, but I do know he left in the summer of 1911, after my first session, and then he became a medical student and practised as a doctor, I believe in the London district — whether he was married or not I cannot say. Prof. Cavers was rather reserved, a gentle type, kindly and courteous, and always ready to help. I do remember at some date reading an obituary notice of his death, but have no idea if this was before, during or after World War II. I should think he was a man of about 40 when I was 17, and as I am now nearly 71 he probably died some little time ago — he was not a strong hearty man. All other members of the staff of his period have now died so that there is nobody left from whom I can get information. I did not know that he had been at Leeds before coming to Southampton. Of course you are familiar with his N.P. reprint on the Bryophyta. I should think that dates back to 1906 or 1908, but I am not sure'.

Through the kindness of Dr. T. E. Wallis, of Mill Hill, London, N.W.7, I am able to reproduce a letter written to him by Cavers in 1912:

'Dear Sir,

On returning from the holidays, I have just seen in the *New Phytologist* your interesting note on the Pellia capsule, and was also pleased to see that you thought so well of the short account of this type given in the little "Practical Botany" text-book — the original account was about three times as long, with about twice as many figures, and the whole book was originally planned on that scale, but had to be severely pruned down to meet the demands of the publishers, unfortunately! Your account of the actual process of dehiscence is certainly quite new and most interesting, but we were *both* forestalled with regard to the dehiscence-lines, which were described in 1899 by Andreas, a pupil of Goebel's, in his "Inaugural Dissertation" for the Ph.D. degree at Munich (reprinted in *Flora*, 1899). His description is very brief, however. The curious thing is that apparently no previous writer had noticed these very striking dehiscence-lines, but things of this kind are often overlooked, and of course it is always worthwhile making a close examination of even the commonest plants. There is plenty of room for interesting work on Pellia, e.g. details of development of the capsule in the earlier stages — this has recently been touched on by an American writer, but very inadequately. If you think of taking up detailed work on Pellia or other Hepaticae, I shall be very glad indeed to offer any assistance in the matter of the literature — I believe I have tracked down everything that has been published on the morphology of this group, because I found it a fearfully difficult business to get results worth publishing until this literature-hunting was done, and it has taken a lot of trouble I can assure you.

Yours faithfully, F. Cavers.'

Summary of Career

1876	Born Hawick.
1894–97	Armstrong College, Newcastle upon Tyne.
1897–1900	Imperial College of Science, London. In the Session 1899–1900 Cavers was awarded the Edward Forbes bronze medal and Prize of Books for Biology, and also the Marshall Scholarship. The former was provided by the Trustees of the Edward Forbes memorial fund, to be awarded to the student who does best in biology; the latter was founded by Miss Sarah Marshall in honour of her father, the late Mr. Matthew Marshall, of the Bank of England, and awarded annually to a student engaged in biological research in the Huxley Laboratory. The funds for this Scholarship are supplied from the interest of £1,000 left by Miss Marshall for its endowment. We learn, however, from Professor Farmer's Annual Report for 1899–1900, that Mr. Cavers's appointment as Junior Demonstrator in Botany at Owens College, Victoria University, necessitated his resignation of the Marshall Scholarship. He was also recommended for an Exhibition, but was 'disqualified by age'.
July 1900	A.R.C.S.
1900–1	Demonstrator in Botany, Owens College, Manchester.
July 1901	B.Sc. (Lond.).
1901–3	Assistant Lecturer in Biology, Yorkshire College, Leeds.
1903	F.L.S. (ceased to be a Fellow in 1917).
1903–4	Lecturer in Biology, Technical College, Plymouth.
1904	D.Sc. (Lond.) (By a thesis entitled, 'Contributions to the Biology of the Hepaticae'). It is interesting to note that in the following year D.Sc.'s were awarded to Agnes Arber, Felix Eugene Fritsch and Marie C. C. Stopes.
1904–11	Professor of Biology, Hartley University College, Southampton.
1911–12	Lecturer in Botany, School of Pharmacy, University of London. (Actual dates, Oct. 1911–July 1912 — see *Pharmaceutical Journal*, 7 Oct. 1911 and 6 July 1912).
1911–15	Reader in Botany at Goldsmith's College, University of London.
1913–16	Assistant Editor, *The New Phytologist*. First Editor, *Journal of Ecology*.
1915–18	University College Hospital, London.
1918	M.R.C.S., L.R.C.P.
1918–25	In medical practice at 42 Hamilton Road, Highbury, London N.5.
1928	Living at Willian, Letchworth, Herts.
1929–36	Living at Oakfield, Knebworth, Herts.
1936	Died 26 May.

Publications

1903

A new Species of *Riella* (*R. capensis*) from South Africa. *Rev. Bryol.* **1903**, 5: 81–4.

On Saprophytism and Mycorhiza in Hepaticae. *New Phytol.* **2**: 30–5.

On asexual Reproduction and Regeneration in Hepaticae. *New Phytol.* **2**: 121–33, 155–65.

Some Points in the Biology of Hepaticae. *Naturalist* **1903**: 169–75, 208–15.

Notes on Yorkshire Bryophytes. I. *Petalophyllum ralfsii. Naturalist* **1903**: 327–34.

Notes on Yorkshire Bryophytes. II. *Pallavicinia flotowiana. Naturalist* **1903**: 441–4, 451–5.

Explosive Discharge of Antherozoids in *Fegatella conica. Ann. Bot.* **17**: 270–4.

Explosive Discharge of Antherozoids in Hepaticae. *Torreya* **3**: 179–82.

1904

On the Structure and Development of *Monoclea Forsteri. Rev. Bryol.* **1904**, 4: 69–80.

On the Structure and Biology of *Fegatella conica. Ann. Bot.* **18**: 87–120.

Contributions to the Biology of the Hepaticae. Part I., *Targionia*, *Reboulia*, *Preissia*, *Monoclea*. Privately printed by Chorley and Pickersgill, The Electric Press, Leeds and London. (I have not seen Part II, if such was ever published.)

Notes on Yorkshire Bryophytes. III. *Reboulia hemisphaerica. Naturalist* **1904**: 208–14, 242–50.

1907

Notes on Yorkshire Bryophytes. IV. *Frullania* and *Jubula. Naturalist* **1907:** 11–16, 46–9.
Plant Biology. University Tutorial Press: London, 1907.
Hepaticae. *Bradford Sci. Journ.*, **2**, 14: 33–7 (Oct. 1907).
Life Histories of Common Plants. University Tutorial Press: London, 1908.

1909

Contributed 5 chapters to Vol. 4 of *The Book of Nature Study* (6 vols.) edited by J. B. Farmer, M.A., D.SC. (OXON.), F.R.S. Chapter IV — Ferns and their Relatives. Chapter V — Mosses and Liverworts. Chapter VI — The Higher Fungi. Chapter VII — Lichens. Chapter VIII — Moulds, Yeast, Bacteria.
Botany for Matriculation. University Tutorial Press: London, 1909.

1910

The Senior Botany. University Tutorial Press: London, 1910.
The Life History of a Peat-Moss. *Knowledge*, 1910. ?–268, 294–301.

1911

The Inter-relationships of the Bryophyta. *New Phytol.* **9:** 81–112, 157–86, 193–234, 269–304, 341–53. *New Phytol.* **10:** 1–46, 84–6.
Practical Botany. University Tutorial Press: London, 1911.

1912

Recent work on the Bryophyta. *New Phytol.* **11:** 265–76.

1913

Recent work on Flagellata and Primitive Algae. *New Phytol.* **12:** 28–36, 78–83, 107–23, 177–87, 225–32.

1914

Gola's Osmotic Theory of Edaphism. *Journ. Ecol.* **2**, 4: 209–31.
Chondriosomes (Mitochondria) and their Significance. New Phytol. **13:** 96–106, 170–80.

1915

Junior Botany. University Tutorial Press: London, 1915.
School Certificate Botany. University Tutorial Press: London.
The Inter-Relationships of Protista and Primitive Fungi. *New Phytol.* **14:** 94–104, 164–8, 223–7, 275–80, 302–4.

This is the sum total of the information I have been able to gather about Cavers. I realise only too well that there are gaps in my account of this somewhat enigmatic man; one wonders, for instance, why he left teaching and bryology at such an early age. The only inkling one gets that perhaps Cavers was not completely at home in teaching is Tansley's statement in the obituary in *Nature* that 'he was not, however, in all respects well fitted for such work'.

For assistance in my search for information on Professor Cavers I am greatly indebted to Mr. F. E. Branson, Mr. A. D. Greenwood, Miss F. M. Loader, Mrs. Jean Paton, Prof. J. Proskauer, Mrs. J. Pingree (Archivist to the Imperial College of Science), Dr. T. E. Wallis, Dr. E. V. Watson; The School of Pharmacy, University of London; the Information Officer of the British Medical Association; and the Clerk to the Knebworth (Herts.) Parish Council.

Dr. E. V. Watson, of the Botany Department, University of Reading, has very kindly written the following note on Cavers, for which I am most grateful.

Dr. Frank Cavers

Mr. G. A. Shaw has asked that I write a brief assessment of the bryological contribution of the late Frank Cavers, D.SC. This is not altogether easy, particularly in view of the very different 'climate of thought' prevailing in botany to-day from that which held when Cavers wrote his most important papers, some 60 years ago.

By far his most bulky contribution to bryology and the one by which he is best known, is 'The Inter-relationships of the Bryophyta'. This was, in fact, a reprint in book form (*New Phytologist* Reprint, no. 4) of a series of papers which had appeared over a period of several years. It is at once a masterly survey of the morphology of the

Bryophyta in the light of the facts available at that time and a challenging attempt to interpret this wealth of morphological detail in a phylogenetic manner.

It is this second part of the author's purpose and achievement which has, I believe, been responsible for the decidedly lowered estimate of his overall contribution which one finds not uncommonly to-day. It is fashionable, especially for American bryologists of 'advanced' views, to decry the work of Cavers, even to the point of regarding him as putting the brake on the progress of bryology in Britain. In my view this is a grossly unfair appraisal of one whose achievement, in the short period of years over which he devoted a part of his time to bryology, was truly remarkable.

Like many others of his generation Cavers may indeed be accused, with a certain justice, of putting a too facile phylogenetic interpretation upon the known facts; and his whole viewpoint in this respect stands in direct contrast to the mood of caution in such matters that prevails to-day. There is, however, no mistaking the penetrating observation, the urge wherever possible to experiment and the invariably lucid exposition that characterised his work. Perhaps these qualities are even more apparent in the series of papers that appeared in *The Naturalist* in 1903–4, less than four years after the time when he had heard the lectures of Professor J. B. Farmer which he declared were his main source of inspiration. These early accounts in *The Naturalist* contain wonderfully full and accurate information on such liverworts as *Targionia hypophylla*, *Reboulia hemisphaerica* and others. They can be re-read to-day with profit. The same is true of his detailed account of the morphology of *Conocephalum conicum* (*Fegatella conica*) that appeared in the *Annals of Botany*, 1904. His chief interest lay with the Hepaticae.

It is important, when trying to assess the contribution of Cavers, to remember that he turned away from bryology and even from botany altogether, at a comparatively early age. Almost his entire bryological contribution was made between 1903 and 1912. After 1916 he ceased to be Editor of the *Journal of Ecology* and appears to have played little further part in botanical affairs. His qualification as a medical doctor, after several years of arduous study, led to a period of useful and lucrative practice in north London, whereafter he was able to retire. In the last period of his life he became deeply involved in the subject of cancer and was successively editor of the *Cancer Review* (1925–32) and of the American *Journal of Cancer* (1932–6).

Long before this period Cavers had ceased to be an active figure in British botany. By 1912 he had not only made all his leading bryological contributions but he had also written six out of the seven elementary textbooks which between them must have brought his name before a far wider botanical public. When one bears in mind that throughout this productive period he was teaching continuously in Institutions of higher education one has to admit that the sheer bulk of his output was remarkable. Much of it was of very high quality too. His *Practical Botany* ran through four editions and my own experience is that even to-day it is a useful book. Its great merit lies in the emphasis on direct, personal observations of plants and their tissues which was so much an integral part of the outlook of its author. One feels that here, as with his bryological work, he lived very close to his material. Yet at the same time, every bryological paper that Cavers wrote is conspicuous for its careful mastery of the relevant literature. He was exceedingly widely informed.

In the circumstances it is tempting to speculate as to what would have been the stature of the man had he, as it were, 'stayed in' botany and continued with bryological studies as a principal research interest. Had he both done this and also lived to a 'ripe old age' then his contributions could easily have extended into the period after World War II which witnessed a noticeable upsurge of interest in bryology in Great Britain. Wholly new techniques and a wealth of freshly acquired knowledge would have become available to him. With his gifts of acute observation and painstaking thoroughness of industry he might indeed have stood out as a great 'doyen' among bryologists of that time.

Even as things are, the work he did and the views he held — for example on the 'antithetic theory' of bryophyte origin — even if unfashionable to-day, are still talking points wherever bryophyte inter-relationships are discussed. His judgment of the facts before him may at times have been faulty, his conclusions in modern eyes too sweeping or dogmatic, but the sureness of his observation and his great power of marshalling a multiplicity of facts are clear enough indications of an exceptionally gifted man. He earned, and has retained, a sure place in the history of bryology in Britain.

July 1968. E. V. Watson.

BRYOLOGICAL MEETING AT HAYBURN WYKE, V.C. 62

21–22 September 1968

F. E. BRANSON

The results obtained from the meeting at Hayburn Wyke were, on the whole, rather disappointing. Most of the area was quite overgrown and the majority of the species found were ordinary inland species. No maritime species were found, although we had in mind *Grimmia maritima* which was formerly recorded near Scarborough (Black) and near Saltburn (Mudd) (see Baker's *North Yorkshire*).

The first day was spent at Hayburn Wyke, following the very muddy track down from the disused railway station to the shore. Because of the dense undergrowth we had to keep mainly to the path and its sides. The best locality was on the banks of the stream just before it poured over the cliff on to the shore. There were some limestone cliffs bordering the stream which bore patches of *Leiocolea turbinata* and *Eucladium verticillatum*. It was pleasing to find *Frullania dilatata* on tree trunks in a couple of places, and while examining a piece of *Hypnum cupressiforme* var. *resupinatum* which I had collected from the base of a tree trunk I found this species and the only *Metzgeria furcata* detected on the excursion mixed with it. There was quite a large amount of *Barbula cylindrica* on rocks by the stream banks and I also collected some fine *Barbula spadicea*. A small gully leading from the shore inland and filled with a tangle of woodland had some fruiting *Hookeria lucens* and *Eurhynchium praelongum* var. *stokesii* growing in it. The only moss seen near the sea was *Bryum bicolor* on a clay bank on the shore. Walking back up from the shore I gathered a pleurocarpous moss from turf at the side of the path, thinking it was *Campylium stellatum*, only to find later, on microscopical examination, that it was a compact form of *Eurhynchium praelongum* which I often come across in similar situations (i.e. in grassland) and by which I have before been misled. In the evening we went to the disused Hayburn Wyke railway station. Such a place is always interesting bryologically as many of the small acrocarps find a place on the tarmac and fine ash with which the platform is usually covered. On the actual platform a small *Riccia* was found which I afterwards determined as *R. sorocarpa* and this was agreed to by Mrs. J. A. Paton. Along the side of the track was some fruiting *Pohlia annotina* with its glove-shaped bulbils and on the wall lining the track some fruiting *Orthotrichum diaphanum* and later, at home, I was able to determine a small plant as *Barbula rigidula*. I also had *Isothecium myosuroides* from a small wood nearby.

On Sunday morning we visited a large quarry near Ravenscar. This was the best place of the whole excursion. The two dominant ground species were both hepatics and both low-growing, viz., *Gymnocolea inflata* and *Nardia scalaris*. There was some fruiting *Bryum pallens* a moss which very seldom produces capsules, scattered about the quarry, also some fine *Ptilidium ciliare* in reddish-brown, lax, patches, and I was pleased to find some *Trichostomum brachydontium*, a moss often found near our coasts. This was the type, although the var. *littorale* is said to be commoner in such situations. Mrs. Gow found a little *Cephalozia media* growing on a stem of *Rhytidiadelphus squarrosus* and Miss Dalby collected *Plectocolea hyalina*. In the afternoon the party went to Staintondale railway station and bryologised along the disused railway track. In a stubble field there was a prolific display of *Pottia truncata* (*c.fr.*) and in various places along the track I saw *Trichostomum crispulum*, *Eurhynchium murale* (*c.fr.*) and *Rhacomitrium fasciculare*, among many others. Miss Dalby had *Rhacomitrium heterostichum* from here.

Miss Dalby collected and determined the following Sphagna from the top of Stoupe Brow, Ravenscar: (Grid Ref. 970012).

Sphagnum recurvum
S. capillaceum
S. cuspidatum (submerged)
S. tenellum
S. fimbriatum
S. plumulosum
S. subsecundum var. *auriculatum*
S. compactum
S. papillosum

Lists for the various localities visited are appended below. Acknowledgements are due to Mrs. J. A. Paton, Mr. J. H. Field and Mr. E. R. B. Little for checking various gatherings. Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg for mosses, and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton for hepatics.

Hayburn Wyke and Hayburn Wyke railway station:

Conocephalum conicum
Lunularia cruciata
Riccardia multifida
R. sinuata
R. pinguis
Pellia epiphylla
P. neesiana
P. endiviifolia
Metzgeria furcata
Lepidozia reptans
Calypogeia fissa
C. arguta
Lophozia ventricosa
Nardia scalaris
Plagiochila asplenioides and var. *major*
Lophocolea cuspidata
L. heterophylla
Chiloscyphus polyanthos
Cephalozia bicuspidata
Diplophyllum albicans
Scapania umbrosa
S. undulata
S. nemorea

Atrichum undulatum
Polytrichum piliferum
P. juniperinum
P. commune
Fissidens bryoides
F. taxifolius
Ceratodon purpureus var. *purpureus*
Dicranella varia
D. heteromalla
Dichodontium pellucidum and var. *flavescens*
Dicranoweissia cirrata
Dicranum scoparium
Campylopus pyriformis
Tortula muralis
Barbula convoluta
B. unguiculata
Grimmia apocarpa
G. pulvinata
Orthodontium lineare
Pohlia nutans
P. delicatula
Bryum capillare
B. pallens
B. argenteum
Mnium hornum
M. undulatum
M. punctatum
Philonotis fontana
P. caespitosa
P. calcarea
Cratoneuron commutatum var. *commutatum*
Amblystegium serpens
Acrocladium cuspidatum
Isothecium myurum
Camptothecium sericeum
Brachythecium rutabulum
B. rivulare
Isopterygium elegans
Plagiothecium denticulatum
P. undulatum
Hypnum cupressiforme
Ctenidium molluscum
Rhytidiadelphus squarrosus

Quarry at Stoupe Brow, nr. Ravenscar (Grid Ref. 960023):

Pellia epiphylla
Lepidozia reptans
Calypogeia muellerana
C. arguta
Lophozia ventricosa
Barbilophozia floerkei
Lophocolea bidentata
Cephalozia bicuspidata
Diplophyllum albicans

Sphagnum palustre
S. recurvum
Polytrichum urnigerum
P. formosum
P. commune
Dicranella heteromalla
Dicranum majus
D. scoparium
Rhacomitrium lanuginosum
Pohlia nutans
Mnium hornum
Philonotis caespitosa
Acrocladium cuspidatum
Camptothecium sericeum
Brachythecium rutabulum
B. rivulare
Pleurozium schreberi
Isopterygium elegans
Hypnum cupressiforme and var. *ericetorum*
H. lindbergii

Staintondale railway station:

Pellia endiviifolia
Riccardia sinuata

Fissidens bryoides
F. taxifolius
Ceratodon purpureus var. *purpureus*
Grimmia apocarpa
G. pulvinata
Camptothecium sericeum
Brachythecium rutabulum
Eurhynchium praelongum
Plagiothecium succulentum

SPRING FORAY AT RIPON, MAY 1968

W. G. BRAMLEY

Once again there was a small attendance at the Spring Foray, only seven answering the roll. If few in numbers quite a lot of work was put in and the assiduous collecting by Dr. Watling and Dr. Richardson is mainly responsible for the list.

Grantley Hall and Spa Gill were visited on Friday, 10th May, Tanfield Lodge and Hackfall on Saturday. The grounds of Grantley were visited again on Sunday followed by investigation of some of the woods in the vicinity of Winksley. On Monday an hour or two was spent at Fountains Abbey and the party dispersed soon after lunch.

It will be noted that many of the records are marked as not in the Yorkshire Catalogue. This is now thirty years old and many advances have been made in that time. Many of these have been recorded in the pages of *The Naturalist*. In the last two years much attention has been paid by the above-mentioned members to the coprophilous fungi and there is no doubt that a great many of these species could be found nearly everywhere in the county on this substrate. The same applies to the aquatic hyphomycetes, a list of which has been provided by Dr. Webster.

At Fountains a quantity of *Sclerotinia* was found only under clumps of *Symphytum* and is referred to *S. sclerotiorum*. In all cases the sclerotia were buried up to 1–2 cm. deep in the ground and none in the old stems lying on the ground.

I have to thank Dr. Hering for a list of his identifications, and Mr. W. D. Graddon for confirmation of some of the discomycetes. To Dr. Webster and Mr. Collinge my gratitude for finding accommodation and transport which enabled me to attend three days at the last moment.

F = Fountains Abbey
T = Tanfield Lodge and Hackfall
S = Spa Gill
(d) = deer dung (?Fallow)
(s) = sheep dung
G = Grantley Hall
W = Winksley
(r) = rabbit dung

† Not listed in *Catalogue of Yorkshire Fungi.*

PHYCOMYCETES (M. Richardson)
Pilaira anomala (Ces.) Schroet., G.T. (r)
Piptocephalus repens de Bary, S (d)

DISCOMYCETES (M. Richardson, W. G. Bramley, T. Hering)
†*Ascobolus albidus*, S (d), T (r), W (r)
†*A. crenulatus*, G (r)
†*A. degluptus*, S (d), T (s)
†*A. immersus*, T (s), W (r)
A. stictoideus, G (r)
Ascophanus microsporus, T (s)
†*Ascozonus woolhopensis*, G (r), T (r)
†*Corynella prasinula* with *Dendrostilbe* on *Fagus*, G
Dasyscypha apala on *Juncus*, T
†*D. brevipila* on *Ulmus*, T
D. clandestina on *Chamaenerion*, G.T.
D. grevillei on *Symphytum*, F.
Lasiobolus ciliatus, S (d), T (r)
†*Micropodia pteridina* on *Pteridium*, T
Morchella esculenta, W
†*Peziza anthracophila*, F.G.
†*P. praetervisa*, G
†*Pyrenopeziza digitalina* on *Digitalis* stems, G
†*Saccobolus versicolor*, G (r)
Sclerotinia sclerotiorum, F
†*Thelebolus nanus*, T (r, s), S (d)
T. stercoreus, G (r)

PYRENOMYCETES (W. G. Bramley, M. Richardson, T. Hering, J. Webster)
Cryptospora suffusa on *Alnus*, G
†*Diaporthe arctii* on *Arctium*, G
D. eres on *Rosa canina*, G
D. taleola on *Quercus*, G
†*Didymella applanata* on *Rubus idaeus*, G
Hypoxylon howeianum (sensu Muller on *Prunus spinosa*, G
Podospora curvula, T (r), S (d)
P. decipiens, W (r)
P. minuta, S (r), T (r, s), W (r)
P. setosa, S (d)
Quaternaria quaternata on *Fagus*, T
†*Sporormia ambigua*, T (r)
S. intermedia, G (r), S (d, r), T (r), W (r)
S. minima, T (s)
†*S. octomera*, S (r)
†*Sydowiella fenestrans* on *Chamaenerion*, G.T

Agaricales (R. Watling)
†*Conocybe vexans*, G
†*Coprinus angulatus*, G, W
†*C. bisporus*, G, T
C. domesticus, G, T
C. ephemerus, G, T (r)
†*C. erythrocephalus*, F
†*C. heptemerus*, G (r), S (d)
†*C. lagopides*, G
C. macrocephalus, G, W
†*C. miser*, W
C. patouillardii, S (d)
†*Galerina ampullaceocystis*, W
†*Melanoleuca adstringens*, G
Nolanea cetrata, T, W
†*N. vernus*, on moss, G
†*Panaeolus foenisecii*, W
Panus torulosus, T
†*Pluteus splendidus*, W
†*Psathyrella albidula*, T
P. obtusata, G, S
†*P. vernalis*, W
Pseudohiatula stephanocystis
P. tenacella

It is nearly impossible to sort out the last two records, as they may have been previously listed as *Marasmius conigenus* or *M. esculentus.*

Aphyllophorales, etc.
Polyporus sulphureus on *Araucaria*, G
Pistillaria uncialis on *Heracleum*, G
Trametes gibbosa, F, T
Tremella foliacea, G
Scleroderma verrucosum, T

Aquatic Hyphomycetes (J. Webster), all from Grantley
Alatospora acuminata
Anguillospora crassa
A. longissima
Articulospora tetracladia
Clavariopsis aquatica
Flagellospora curvula
Heliscus longibrachiatus
Lemonniera brachycladia
Pyricularia aquatica
Tetrachaetum elegans
Tetracladium setigerum
Tricladium angulatum
T. splendens
Varicosporium elodeae

Other Hyphomycetes (T. Hering)
Coniothyrium fuckelii on *Rubus*, G
†*Myxosporium roumegueri* on *Corylus*, W

AUTUMN FORAY AT WREA HEAD, SEPTEMBER 1968

W. G. BRAMLEY

The autumn foray of 1968 was somewhat of a departure from normal, being designed especially for those with little or no knowledge of fungi. Altogether some twenty-five members and students spent a weekend at Wrea Head near Scarborough, the North Riding County Council's adult education centre. Owing to a change of date the foray clashed with the Y.N.U. — Y.N.T. symposium held at York and two or three of our regular members were unable to be present.

Fortunately for a foray of this kind we were not overwhelmed by a plethora of specimens, but a representative collection of genera was brought into the work room. Though the emphasis was on agarics, other genera both of basidiomycetes and ascomycetes were collected and displayed. About half the time was devoted to collecting and the other half to lectures by Dr. Webster, and examination of specimens in the work room. Microscopes and other apparatus brought by Dr. Webster enabled most of the students to study the material and there were enough older members present to help smooth over difficulties which arose. It is to be hoped that the exercise may bring one or two into the mycological fold.

Cloughton Woods as usual provided good collecting but nothing particularly out of the way was gathered. This is one place where *Paxillus atrotomentosus* can generally be found and many large specimens were seen. *Nummularia lutea* was also gathered whilst a single apothecium of *Chlorociboria aeruginascens* was a very late date.

Under the guidance of Mr. G. Simpson, the Forestry Commission's Wild Life Officer, a very enjoyable day was spent in the Black Park and Sutherland areas of the Cropton Forest and we were saved a lot of walking by being able to take the bus through the forest rides. Here quite a number of Boleti were picked up, including *B. felleus* with its pink pores. *Lycoperdon echinatum,* an uncommon puffball, was also gathered as well as several aggregations of *Collybia cookei.*

Forge Valley was very poor and disappointing, less than a dozen species being recorded and an hour in Hackness Park did not add a lot more.

BOOK REVIEWS

Flora Europaea: Vol. 2, Rosaceae to Umbelliferae edited by **T. G. Tutin, V. H. Heywood, N. A. Burges, D. M. Moore, D. H. Valentine, S. M. Walters** and **D. A. Webb.** Pp. xxx + 456 with 5 maps. Cambridge University Press. 1968. £7. 7. 0.

The second part of this major systematic work has been eagerly awaited. Fifty families are covered in the present volume though half of the volume is occupied by the two families Rosaceae and Leguminosae. Probably no volume will raise greater difficulties than this one. How to deal on a continental scale with the apomictic genera *Rubus, Rosa, Alchemilla* and *Sorbus*, in which the number of taxa which have been described at the level of species is very large (some 2000 in *Rubus* subgenus *Rubus*) poses formidable difficulties. Some sort of compromise scheme was inevitable and the problem has been met in *Rubus fruticosus* by describing 66 'circle-species' which are relatively widespread and distinct and listing after the appropriate one to which they are most nearly allied, the names, places of publication and countries of origin of 374 related species. In *Alchemilla*, in which more than 300 European species have been recognised, descriptions are given of 118 species and 143 more are listed under their nearest related species. The same procedure is followed in *Sorbus* with 18 described and 73 listed species. *Rosa* is, by comparison, a simple genus with 47 species described and no lists of related but undescribed species.

Genera with 50 or more species covered in this volume, apart from those referred to above, are *Astragalus* (133), *Euphorbia* (105), *Trifolium* (99), *Viola* (92), *Potentilla* (75), *Genista* (56), *Vicia* (55) and *Lathyrus* (54). The arrangement follows exactly on the pattern of the first volume and the fact that no modifications have been found necessary is a tribute to the initial care with which the work was planned. The treatment of groups of closely related species as collective species in the main keys to the genera followed by separate keys to the species or subspecies under the appropriate group heading within the body of the generic account is a particularly useful arrangement.

Inevitably there is the usual crop of name changes which is an inseparable accompaniment of any such work. The Rosebay Willow-herb becomes an *Epilobium* again and Dogwood and Dwarf Cornel revert once more to *Cornus sanguinea* and *C. suecica. Hydrocotyle* is put back again into the Umbelliferae — and by the same editor who took it out a year or two ago in the second edition of Clapham, Tutin and Warburg's *Flora of the British Isles. Peplis portula* becomes *Lythrum portula*, the Tamarisk of our south and south-eastern coasts is no longer separated from the continental *Tamarix gallica* and the perennial English flax is demoted to subspecific rank under *Linum perenne*. Species of *Poterium* and *Sanguisorba* are once more reunited within a single genus but the generic name now favoured is *Sanguisorba* and so the Salad Burnet becomes *S. minor* Scop. with the former *Poterium polygamum* treated as a subspecies *muricata* of the same species. The familiar *Agrimonia odorata* is replaced by *A. procera* Wallr., and the Hawthorn known to us for so long as *Crataegus oxyacanthoides* Thuill. becomes *C. laevigata* (Poir.) DC. *Helianthemum nummularium* replaces *H. chamaecistus* as the name for the common Rockrose, *Viola persicifolia* replaces *V. stagnina* and *Euphorbia villosa* is substituted for *E. pilosa*. Any British botanist who fondly imagined therefore that the nomenclature of our own plants had become stabilised with the appearance of Dandy's *List of British Vascular Plants* will be disillusioned. The goal of nomenclatural stability is as elusive as ever; nor can stability ever be more than relative for when taxonomic judgements change nomenclatural changes inevitably follow. But not by any means all or even the majority of the name changes here are due to such causes. The magnitude of the task which has faced the writers must have precluded the laborious research often necessary to solve the more knotty nomenclatural problems. Yet a work of this kind generates an aura of authority and this will tend to confer on its nomenclature a degree of certitude which, one suspects, it may not always deserve.

The work on this volume was completed in February 1967 and the delay of 22 months in its appearance was evidently due to production problems. Let us hope that contributors are now well advanced with their work on the sympetalous Dicotyledons which will form the third volume. Quite apart from the very great merit and utility of its contents this is a beautifully produced book; the sound judgement shown in its planning and the uniformly even and meticulous editing are matched by the fine printing, the good paper, the attractive format and the sturdy binding.

W.A.S.

The Whale, edited by **Dr. Leonard Harrison Matthews.** Pp. 287 with over 100 full-page illustrations, some coloured, and numerous text figures. George Allen & Unwin Ltd. 1969. £5 15s. 0d.

This is a natural history book of the highest class. It does not deal with the specialised scientific problems such as the physiological adaptations to diving or the curious hearing mechanisms of whales, though there is an interesting introductory account of their method of echo-location, but on the general biology of cetaceans and their unfortunate associations with our own species the whole book is most readable and authoritative. The history of whaling is followed from the earliest times to the present day, with full details of the crafts sailed in and the implements used for capture and disposal of the catch, and the techniques of fishing developed by different peoples in all the seas of the world. Other chapters deal with the distribution, feeding and way of life of whales, the uses to which their products are put and a final chapter on the literature of the subject. Despite the dreadful cruelty involved in all methods of killing whales and the perils and hardships of the calling, whaling remains one of the most romantic of human activities; partly no doubt since it was a gamble, of lives against profit, but partly surely because it tested men to the limit of their powers and in that sense was the ultimate sport. Now it appears to be on the wane and as a salute to its passing, the present book, beautifully produced and illustrated with the most delightful reproductions, photographs and coloured plates, is a worthy tribute. The price is eminently reasonable and this volume would justify a place on any zoologist's shelf and in all school libraries. T.K.

Modern Biology by **Hans Joachim Bogen,** translated from the German by Harold Oldroyd. Pp. 336 with 182 photographs and figures. Weidenfeld & Nicholson (Educational) Ltd., London. 45/-.

The author tells us that this book has been written '. . . for a particular kind of person. He is someone who learned biology at school, and still remembers some of it. He reads the more serious daily and weekly periodicals and tries to follow the progress of modern biology from them'. To help him, Professor Bogen provides an account of the state of knowledge of some of the fashionable fields of modern biology, namely molecular genetics, genetics of bacteria and phage, fine structure of cells, gene regulation, immunobiology, and the origin of life, apparently as they stood sometime in 1966. Professor Bogen clearly understands these subjects well. His approach is thorough. Where most authors of a book for laymen scientists would choose simplification, at some cost in strict accuracy, Professor Bogen invariably prefers to sort out the detail. To be fair, he recognises that to read right through his book with understanding will require some effort on the part of his chosen class of reader, but he explains in his postscript why he is glad that it should be so!

This is a well-produced, clearly and elegantly illustrated, basically sound book. It is marred by a limited number of errors, the most obvious of which rather surprisingly occur where the book concerns itself with more traditional and long-established biological fields. Some of the illustrations of mitosis and meiosis are wrongly labelled, the errors evidently arising from a misunderstanding of the nature of metaphase. The division of the plant kingdom (Fig. 173) into algae, mosses, ferns, pteridophytes, phanerogams, and cryptogams is bizarre, to say the least, but is acerbated by mis-labelling which results in the pteridophytes arising in the Late Carboniferous, and cryptogams in the Jurassic! I have not seen the original, but one suspects that mistakes in translation are the cause of error here. The translation is however very fluent, although occasionally insecure in the high-risk field of terminology. The reviewer himself confesses to a feeling of insecurity aroused by the terms 'codogen' and 'gone', which are new to him. There is some logic in their use, since there are no exact English equivalents, but it is amusing to note that the obvious possibility of confusion between 'gone' and 'gene' is in fact realised by the compositor on p. 93! Certain of the other errors, e.g. typhus for typhoid (p. 134) are simple slips, but the bald statement (p. 197) that 'This method is called oblique vapourisation', when in fact it is usually simply called shadow-casting, and two errors on pp. 72 and 74 which clearly show mis-application of 'nucleolus', confirm one's regret that the publishers did not have the translation of Professor Bogen's worthy book checked by someone more completely familiar with the terminology involved. J.D.L.

General Biology by **William J. Taylor** and **Richard J. Weber.** Pp. xv + 977, with 456 text figures and tables and one colour plate. Van Nostrand. Second edition, 1968. 105/-.

This is the second edition of a text-book which presents a prodigious amount of factual information, but in spite of the fact that the authors state that it is not a do-it-yourself kit but requires a teacher, it is nevertheless best regarded as a biologist's reference book, for it is stylistically unsuitable for concentrated reading. The problem of presenting facts in an interesting, stimulating and palatable manner must be a major one confronting the authors of text-books. Unfortunately it is also one which is rarely overcome. This book is written in short sentences giving the impression of condensed notes, a process carried, on occasions, almost to the point of confusion. The lack of connecting phrases and the exclusion of associative ideas result in the reader being subjected to an almost indigestible machine-gun-like bombardment of information. However, if the quest is for information it can certainly be satisfied here, and this factor would make the book a most useful addition to the school library.

Plants and animals are dealt with separately and fairly comprehensively. There are three general chapters dealing with living matter, protoplasm and cells, followed by twenty-seven chapters devoted to the plant kingdom in its various aspects. These are in turn followed by twenty-nine on the animal kingdom, and then one chapter each on ecology, genetics and evolution, the whole making quite a weighty volume. There is a considerable glossary which does much to offset the lack of definitions in this terse American text. For example, the Krebs cycle is mentioned several times by name but without any explanation or cross references before it is finally presented in diagrammatic form in the chapter on plant metabolism, the ninth in the book.

Nevertheless, an intelligent sixth former or student, by a judicious use of index and glossary along with the text would certainly emerge a great deal wiser after a session with so much concentrated information not normally presented in text-books of biology. If he should be stimulated to read more widely there is a useful bibliography to point the way. I.W.

An Introduction to Plant Taxonomy by **C. Jeffrey.** Pp. 128 with 8 plates and 20 text-figures. Churchill, 1968. 24/-.

Botanists who are actively interested in systematics ought to be well acquainted with the principles of plant taxonomy. The present book gives a clear account of its basic purposes and workings, the approved methods employed in its practice and the essential rules governing the naming of plants. The approach is simple and straightforward with a minimum of technicalities and designed to be readily intelligible to botanists without any academic background. This is a branch of the subject which often receives scant attention in the teaching of botany and since a proper understanding of basic principles is essential for effective practice, its contents should be familiar to all who are concerned with systematics. W.A.S.

A Fowler's World. An Account of Days on the Marsh and Estuary, by **Ian Niall.** Pp. 163 with numerous line drawings and page decorations by C. F. Tunnicliffe. Heinemann, London. 1968. 35/-.

Chapters devoted to wildfowling tales in marsh, water meadow and estuary are filled with detailed first-hand observation gained from lifelong experience in the field. One might not however completely agree that the Heron is a regular predator on Mallard ducklings, or that, as far as wildfowl are concerned, 'In an hour or so the sound of the gun will have been forgotten'.

Towards the end of the book the author deplores the recent rise in the numbers of irresponsible shooters who lack not only the skill and knowledge to kill a bird properly, but often the ability to recognise it from other species. One hears much to malign the wildfowler in these crowded islands where all those interested in the various aspects of wild bird life must eventually learn to co-exist. This book may play a small part in this process.

Many bird watchers would agree that 'There is always something mysterious about the migrant fowl', but all who are interested in the survival of wild places and the creatures therein would echo the author's hope that 'Responsible fowlers and responsible conservationists will undoubtedly see to it that whatever controls come in the future, they are based on fact and logic and not emotion and mere supposition'.
M.D.

The Harewood Park Bird Report. Obtainable from R. V. Jackson, 5 Wensley Grove, Chapel Allerton, Leeds LS7 2NB. 5/– post paid.

Although I learn from the text that this is the fifth such report, it was the first I had seen. Consequently I was surprised to find its title something of a misnomer. Harewood Park birds occupy in fact 9½ pages, while 17½ are devoted to ringing activities of the North Leeds Group over a wide area, their nest record returns, an acrocephalus survey at Swillington, a study of a Blackbird roost at Rufforth, etc.

At the risk of being accused of pedantry I must express the hope that certain points will be remedied in future reports. The persistent use of *its*' (*its*' origin, *its*' activities, *its*' breeding range, etc.) and of pullus, where pulli is correct, tend to jar. 'Double-brood' as a verb is an unwelcome introduction and to label sheets of water as 'The Main Ing' and 'Little Ings' indicates lack of understanding of the word's meaning.

I may be accused also of reading too much between the lines but must confess to certain misgivings. The ringing of Reed and Sedge Warblers we are told, was done mainly in August and September. Yet over one-third (60 out of 169 Sedge, and 27 out of 82 Reed) were ringed in April, June and July. Breeding birds cannot have benefited. The ringing of young Tree Creepers, Wrens, Tits (? in nest-boxes) and a total of 283 nestling Willow Warblers denotes enormous enthusiasm. Was it entirely judicious? Empty nests (taken as proof of successful fledging?) may rather indicate *premature* departure of the young, or equally their loss to predators whose task of seeking out prey has been made easier. I find it incredible that out of 303 Willow Warblers hatched, 289 reached the free flying stage.

One is led to question how proof could be obtained that the four young Woodcock which hatched did in fact fledge successfully. How could one know that Kingfisher nesting chambers were enlarged and confirm that no eggs were laid in them without at the same time being the possible cause that nesting attempts were abandoned? With such a species in particular, the welfare of the bird must always be the first consideration beside which the amassing of pseudo scientific data is of relative unimportance.

On the other side of the balance sheet, objectives were clearly given considerable forethought; the obvious enthusiasm and effort which went into the year's work are entirely commendable; and it is most satisfactory that a report for 1968 should be already available. Blackbird, Starling and Linnet recoveries of particular interest are reported and there is further evidence for the movements of Canada Geese. The ringing of 616 Blackbirds in one roost in one winter season is a remarkable achievement. To have had 138 'controls', and two overseas recoveries, both in Finland, makes the work even more worthwhile. It is a pity that the interim report on this study has not been submitted to *The Naturalist* in order that it might be more widely read. Other sections also merit inclusion. R.F.D.

Whitewings: The Life History, Status and Management of the White-winged Dove, edited by **Clarence Cottam** and **James B. Trefethen.** Pp. 348 with 61 figures and 2 colour plates. D. Van Nostrand Company Inc. 1968. 70/–.

The White-winged Dove (*Zenaida asiatica*) is an extremely important game bird of the south-western United States, especially in Texas and Arizona. Owing to the shooting pressure to which it is subjected and alterations in its habitat the species has been decreasing since 1945.

This book, the result of some ten years research by the game departments of Texas and Arizona and the U.S. Fish and Wildlife Service, deals with the breeding biology, food, habitat, migration and methods of conservation. It is well written in an expansive style and lavishly illustrated although the reproduction of some of the plates leaves something to be desired.

The species was named Linnaeus in 1758 from a specimen described in George Edward's *Natural History* published in 1747. This gave the type locality as the East Indies, hence the specific name *asiatica*. In fact the bird is a purely American one and the specimen described by Edwards probably came from Jamaica.

The book gives an insight into the problems facing the conservation movement in the U.S.A. and makes interesting reading. I am afraid, however, many British ornithologists will be deterred by the cost. P.J.S.

British Names of Birds by **Christine E. Jackson.** Pp. 125. H. F. and G. Witherby. 30/–.

'The bird-watcher will find the book useful to establish species when he hears dialect names being used,' we are told. I doubt very much, however, whether bird-watchers will make much use of it. Dialect names are dying out; and in any case most county avifauna publications already have their own lists, with more detail than can possibly be collected into one volume such as this. Chislett (1952) contains no such list for Yorkshire, but Nelson had already done so comprehensively. He included many local names not reproduced here.

Whether such a book makes confusion less confounded is doubtful when 'Stormcock' can be Mistlethrush, Greenwoodpecker or Fieldfare, according to locality. It is a pity Miss Jackson does not include one of the last's more expressive names — 'Chucker'. 'Cuddy' is a name which may apply to Wren, Tree Sparrow, Moorhen, Treecreeper or Dunnock. As a village boy in Buckinghamshire, up to about the age of eleven I knew the Dunnock by no other name than 'Tootie', nor the Chaffinch than 'Choddy'. Both were universally used but do not occur in this book. The Long-tailed Tit was 'Bumbarrel', a name which I discover here was also used in Notts.

That the lists of names are far from complete may be the fault of the literature rather than that of the present author but it is regrettable that no bibliography is given and one cannot in consequence be sure which sources have and which have not been consulted.

For the most part, numbers in the index are in Roman type and refer to arbitrary numbering of the list of British names. Despite advice on this point I inevitably found myself using them as page references. These, also, should have been given for all entries in the index. In addition to dialect names, there are sections giving falconers', wildfowlers', bird-fanciers' (-catchers') and swan-keepers' rather specialised vocabularies, as well as poetic, and collective names and terms applied to the young of certain species.

British Names of Birds may have proved an interesting academic exercise but will not, I fear, have a very wide appeal.

R.F.D.

Wild Season by **Allan W. Eckert.** Pp. 244, with seven line-drawings by Karl E. Karalus. Gollancz, 1968. 30/–.

The month of May is the wild season and it is the happenings in the world of nature during this one month which are recorded for us here. The scene is set at a lake created by glaciers of the ice-age on the Wisconsin–Illinois borders. The theme is that 'there exists a persistent interdependency of its creatures one upon another. And there is never waste'. Persistently through my mind as I read this book, ran the ditty, 'There was an old woman, who swallowed a fly . . . ', except that here it is a bullfrog which is eaten by a largemouth bass. This is caught and gutted by fishermen, the entrails attracting a raccoon which in turn is attacked by a bot- (warble-) fly. A meadowlark eats the warble-fly, emits undigested grain in its faeces thus providing a young shoot of corn as food for a rabbit. So far we are only half way through the story and I must not anticipate your enjoyment by itemising how the snapping turtle, woodland deer-mouse, pine warbler, bull-snake, musk-rat, crows, great horned owl and others fit into the picture.

I think you will already guess that however vividly and imaginatively the life-stories of these creatures are written, they are not based on actual observation, especially as they are ascribed to only sixteen days in the one month of May. The graphic descriptions and inevitability of each creature providing a meal for the next will suit youngsters rather than serious students.

R.F.D.

A Contribution to the Ornithology of Zambia by **C. W. Benson** and **M. P. Stuart Irwin.** Pp. xiii + 139. Zambia Museum Papers 1. Published on behalf of the National Museums of Zambia by Oxford University Press. 50/–.

Described as 'an essential preliminary and supplement to a new and greatly revised book on the birds of Zambia which is to be published shortly', this paper is a list of some 240 selected species. It gives details of their distribution based mainly on field-work during 1962–5, especially in the hitherto little-known parts of Western Zambia, particularly Barotseland; discusses certain taxonomic problems and presents more information on breeding seasons.

The Sounds Between by **Roscoe Howells,** foreword by Wynford Vaughan Thomas. Pp. 192, 50 illustrations. Gomerian Press. 40/–.

The islands of Skomer, Skokholm, Ramsey and Grassholm off the west coast of Pembrokeshire have for many years attracted naturalists because of the sea-bird colonies, and the beauty of their scenery. This has tended to distract attention from the people who have tried to make a living by farming, catching rabbits and fishing from the islands. This historical survey rectifies the omission in an interesting and racey way, with particular emphasis on the fluctuating fortunes of island farming. The hard life develops character and individuality in the people who in turn made their mark on the area. Now all these islands are nature reserves and the farm life is almost gone. Mr. Howells' specialised knowledge as an agricultural journalist and a Pembrokeshire man has produced a most valuable local history, which everyone interested in that part of Wales should read. J.D.P.

I'll Trade You an Elk by **Charles A. Goodrum.** Pp. 220. Phoenix House, London, 1968. 30/–.

The author's father, Bernie Goodrum, was Director of Recreation of the city of Wichita, Kansas, and as such had charge of the municipal zoo. This is the story of how the zoo rose from obscurity to a dizzy peak of near greatness and then sank to its former state. It is a marvellous story, full of incident, and can be recommended to the widest public; those who at any stage in their lives have owned an animal and/or worked for a municipal employer, or done both simultaneously, will appreciate this book to the full. The funnier passages will no doubt be anthologized in the future and the whole work should be required reading in Zoological gardens, wildlife parks and Corporation Parks' Departments everywhere. By way of a postscript it may be worth mentioning that the author did not follow in his father's footsteps and also, after Bernie Goodrum's retirement, plans were afoot to restore Wichita zoo to glory — along the lines that Goodrum himself had advocated in his pioneering days.

T.M.C.

A Handbook for Naturalists, edited by **Winwood Reade** and **R. M. Stuttard.** Pp. 160 with numerous illustrations. Evans Bros. 12/6d.

This little paper-back was produced on the recommendation of the Council for Nature's Youth Committee, with the initial aim of helping school leavers in any natural history pursuits. It may also provide a useful source of information for any amateur naturalist, for it deals briefly with a wide variety of topics.

There are ideas for field work, both for individuals and for groups, and notes on the establishment of nature reserves and nature trails. A chapter outlines types of equipment needed and there are useful lists and details of organisations and publications, as well as a general naturalist's bibliography. Another chapter deals with the law and the countryside.

Nearly half the book is devoted to a survey of the animal and plant kingdoms and how they are classified. This part would doubtless prove helpful to those with no academic training, but one wonders whether it might not have been greatly reduced, so that the book could be cheaper, or could have included more detail in the practical notes. N.V.M.

Birds from the seas, scrubs and swamps of Australia by **Harry Frauca.** Illustrated by Claudy and Harry Frauca. Pp. 122 with 85 plates, 15 in colour. Heinemann. 50/–.

The title of this book might lead the purchaser to suppose that it is primarily an identification guide, but in fact it is an interesting account of the breeding biology and young of a selection of Australian birds. The species are chosen in various ways, some by nesting sites and some by habitat, giving the book a rather discursive air. The descriptions of the nest construction of the honeyeaters, 'the most Australian of birds', and the scrub turkey (*Alectura lathami*) are of particular interest. The illustrations are profuse and many are in colour. One can recommend this book as supplementary reading to any ornithologist visiting Australia, particularly the state of Queensland.

J.D.P.

The Entomologist's Record

and Journal of Variation

A monthly illustrated magazine, founded by J. W. Tutt in 1890, is devoted mainly to the Lepidoptera of the British Isles. It also deals with other orders of insects especially Coleoptera, Diptera, Hymenoptera, Orthoptera. Its articles include descriptions of new species and varieties, reports on collecting trips, distribution, habits and habitats of insects and of collecting and study techniques suitable for novice and expert. It circulates in 47 countries.

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W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds
with the assistance as referees in special departments of
R. F. Dickens
Ellen Hazelwood, F.L.S.
J. H. Flint, F.L.A., F.R.E.S.
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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CHISLETT MEMORIAL LECTURE

The Fifth Chislett Memorial Lecture will be held in Leeds on Saturday, 27th September 1969, at 6.30 p.m. (to follow the afternoon meetings of the Botanical Section). The speaker will be Dr. F. H. Perring, on 'Recording Britain's Wildlife'. Dr. Perring is head of the Biological Records Centre of the Monks Wood Station of the Nature Conservancy. From 1954 to 1962 he worked on the Botanical Society of the British Isles Distribution Maps Scheme, initially as assistant to Dr. Max Walters and then, from 1959, as Director.

The mapping scheme undertaken by the Botanical Society and resulting in the publication of the *Atlas of the British Flora* in 1962 has been the basis for Distribution Mapping Schemes for other groups subsequently, such as butterflies and moths, dragonflies, etc., and the Biological Records Centre also assists with mapping schemes organised by other bodies such as the British Trust for Ornithology's current Ornithological Atlas. Dr. Perring's talk should therefore have a wide appeal for all Y.N.U. Sections.

Y.N.U. NEWSLETTER

The Y.N.U. Newsletter, sent to all Full members and Affiliated Societies, is published three times a year: February, May and November. Its aim is to provide a means of intercommunication between all members by giving, for example, reports on Y.N.U. and Society meetings and activities, items of broad Natural History interest, details of all types of surveys and enquiries. All items should be sent to the Newsletter Editor: Mr. H. T. James, 238 Sigston Road, Beverley, Yorks.

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A CONSERVATIONIST'S APPROACH TO WILDLIFE PROBLEMS

IAN PRESTT

(*Toxic Chemical and Wildlife Division, Monks Wood Experimental Station, Huntingdon*)

Until comparatively recently most problems affecting the conservation of the natural flora and fauna in Britain have arisen as a direct result of local events. Such things as the building of a new factory at the edge of a town on what was previously a common, the felling of a wood, or the draining of a marsh. It is understandable therefore that much of the attention of the County Naturalists' Trusts, which form the basis of the voluntary conservation movement, has been given to trying to anticipate local changes of this type to limit wherever possible the destruction of the countryside and its wildlife. Some recent events have shown that there is now an increasing risk to the flora and fauna as a result of events which took place a considerable distance away, often well outside a county's boundaries. This means that however conscientiously a County Trust may have made provision to safeguard its local flora and fauna, its efforts could be greatly diminished by the occurrence of an incident outside its immediate control, possibly taking place even without its knowledge. One such event, which will be discussed in this paper, is the present use of persistent toxic chemicals. There have been other recent examples, one being the wreck of the oil tanker, *Torrey Canyon.* Oil from this wreck affected the coasts of Cornwall, the Channel Islands, and reached the shores of France. Had the normal prevailing south-westerly winds been blowing, the oil would almost certainly have affected all coastal counties of southern England, possibly even reaching Wales.

Obviously incidents of this kind, with widespread effects, are going to give rise to new problems and we will have to alter our approach to conservation to deal with them. I want to stress three aspects of this situation: (a) the fact that we have now entered an era when large-scale events are much more likely to occur, probably in ever increasing number; (b) to deal with them there will be an increasing need for professionalism in conservation; and (c) it will be necessary to plan ahead and establish a high degree of co-operation between all conservation bodies.

The first aspect, the greater likelihood of large-scale events occurring, is largely a reflection of present day advances in technology. Most events nowadays tend to be of greater magnitude and will thus have a greater impact. Until the last World War it was perfectly possible for the Royal Air Force to test their most powerful high explosive bombs on ranges in Britain, whereas today nuclear devices can only be exploded in a few very remote parts of the globe — even then most countries receive some effect in the form of radio-active fallout.

To consider the specific example of the use of persistent toxic chemicals and their effect on wild birds. Although some of the effects of these on wild birds have been established, research into other possible effects is still in progress. Initially, therefore, I will simply recount a number of changes which have been observed in many bird species in Britain since 1945, and then go on to discuss the possible link of these with chemicals.

From a discovery not made until 1967, we now know that the first incident took place twenty years ago. Ratcliffe (1967), while investigating the current widespread breeding failure in the Peregrine (*Falco peregrinus*), discovered that in the late 1940's the eggshells of this species underwent a marked (19%) decrease in weight, indicating a reduction in the thickness of the shell. This deterioration in shell quality, which has continued to the present day, is undoubtedly an important factor in the breeding failure of this species. We now know that this same phenomenon has affected several other species, including the Golden Eagle (*Aquila chrysaetos*), Sparrow-Hawk (*Accipiter nisus*), Heron (*Ardea cinerea*), Cormorant (*Phalacrocorax carbo*), Shag (*P. aristotelis*) and Carrion Crow (*Corvus corone*) (Ratcliffe in prep, Prestt in prep).

The second event, this time all too obvious, was the death of thousands of granivorous birds in the spring in the late 1950's and early 1960's (see Cramp *et al.*, 1962).

The third incident again came to light following work on the Peregrine. As a result of representations made to the Home Office by racing pigeon interests, a national survey of the Peregrine was carried out by the British Trust for Ornithology in 1961 and 1962. Its purpose was to see if the Peregrine had become exceptionally common. The results showed the opposite to be the case. A rapid decline in numbers had begun in about 1955 in southern England and then spread northwards eventually affecting

Wales, northern England, southern Scotland and parts of the Highlands and Islands. By 1961, two-fifths of the pre-war population had disappeared and only 82 pairs (19 per cent of the territories visited) were known to rear young; in 1962 only half the known territories were occupied and the number of successful pairs had fallen to 68 (13 per cent) (Ratcliffe, 1963).

Following the discovery of the decline in the Peregrine, national surveys were carried out of the other common birds of prey in Britain (Prestt, 1965). These showed that, during the late 1950's and early 1960's, the Sparrow-Hawk had declined throughout Britain and the Kestrel (*Falco tinnunculus*) and Barn-Owl (*Tyto alba*) throughout the eastern half of England. Studies being carried out of the Golden Eagle showed that during the same period there had been a relatively sudden decrease in the breeding success of Eagles in the sheep-country in the Western Highlands of Scotland. Between 1937 and 1960 seventy-two per cent of the pairs present in the study area fledged young, whereas from 1961 to 1963 only twenty-nine per cent fledged young (Lockie and Ratcliffe, 1964). Studies in progress of the Sparrow-Hawk and Heron (Prestt and Bell, in prep.) have shown these species also to be affected by widespread breeding failure.

The main point I want to emphasise, regardless of possible causes, is that in the last twenty years a series of apparently unprecedented events affected certain, mainly predatory, bird species in Britain. In no case was the effect localised or confined to a single county, they occurred without any anticipation by ornithologists or conservationists and, with the exception of the deaths of the granivorous birds, only came to light by chance some considerable time after widespread changes in populations, or marked decreases in breeding success, had already begun.

The first of the persistent organochlorine insecticides (DDT and BHC) came into widespread use in Britain in the late 1940's; more toxic compounds (aldrin, dieldrin and heptachlor) did not appear on any large scale until the late 1950's. The following is an outline of the cases for and against the organochlorine insecticides being the cause of some or all of these events. First, the case for implicating the organochlorine insecticides: it is suggested that because several different species have been simultaneously affected in much the same way, they were exposed to a similar factor; sudden unprecedented changes suggest new unprecedented causes; there is a close correlation in space and time with the change in eggshell weight and the introduction of DDT and BHC and the population declines and the widespread use of aldrin, dieldrin and heptachlor; after certain bans had been imposed between 1962–5 on the use of the last three compounds a recovery was recorded in the population or breeding success of most of the species previously affected; surveys of residues in wild birds showed that species suffering declines were those in which high residues were present; laboratory experiments have demonstrated sub-lethal effects, such as a delay in ovulation; and it has been established in both the laboratory and the field that dieldrin can pass along a food chain from dressed seed, to graniverous mammals and birds, to predators, resulting in the death of raptorial birds or predatory mammals at the end of the food chain.

The case against this is: despite the widespread use of persistent chemicals, the populations of most wild birds (as indicated by the ringing totals and nest record card returns of the British Trust for Ornithology) appear to be all right; the levels present in tissues of birds poisoned in the laboratory are generally much higher than those found in dead wild birds; birds in laboratory experiments appear to be able to tolerate much higher levels than are generally obtained by wild birds; and while some birds of prey probably have declined, or suffered a decrease in breeding success, the data about these are too imprecise to correlate the start of the changes with the introduction of persistent chemicals. Both sides agree that the death of the graniverous birds was undoubtedly as a result of organochlorine poisoning, the birds having consumed an acute dose of the aldrin or dieldrin seed-dressing with the seeds on which they were feeding.

That two such opposite views still exist on this subject is an indication of how intractable a problem of this kind can be, involving as it does aspects of both chemistry and animal physiology and ecology. The difference of opinion is largely a reflection of the difficulties and complexities of the research required and of the commercial value and benefit of the chemical products concerned. When the Government's Advisory Committee on Poisonous Substances used in Agriculture and Food Storage reviewed the persistent organochlorine insecticides (Cook, 1964) they accepted, "that the use of certain of these pesticides has probably been a major factor in the recent decline of some British birds of prey" (pp. 20–21).

Initially, following the introduction of persistent chemicals into agriculture in Britain, considerable ill-feeling was aroused between some conservationists and certain agricultural organisations and sections of the chemical industry. Liaison committees have now been set up and a code of practice agreed. It is important to realise, however, that industry will not lightly accept evidence against its products. Thus Shell Research Ltd., using data obtained in its own laboratories from experiments in which dieldrin has been fed to humans, dogs and birds (cf. Robinson, *et al.*, 1967, and Robinson, 1969), has vigorously promoted a campaign defending the use of dieldrin. They have also subjected the work of the various conservationist bodies to extremely detailed scrutiny and drawn attention to what they consider to be the weaknesses in the evidence, e.g. at the First Rochester Conference on Toxicity, held in June 1968, Rochester (U.S.A.), Dr. J. Robinson of the Shell Tunstall Laboratories devoted a considerable part of a long paper to criticism of much of the work carried out in Britain on birds of prey (Proceedings, in press).

This course of action is not unexpected. It is understandable that the Shell Company should desire to justify the sale of one of its products if its use is subsequently criticised, whatever the source of the criticism. I am not concerned with the merits or otherwise of industry's reactions, the point I want to stress is that the type of large-scale event I have been discussing will most probably have been initiated by a large industrial concern or public body. Such organisations are extremely powerful and can draw on large resources and so are difficult to oppose. Indeed their very size can by itself make the situation confusing. Thus at the same time one department of the Shell Company can be opposing conservationists' requests for the withdrawal of certain chemicals, while another is giving financial support and publicity to Nature Trails.

It is the difficulties that may be encountered in trying to deal with this type of problem that give rise to my second point — the need for increased professionalism in conservation. To illustrate what may be involved, we can consider the time, manpower and expense that has already been devoted to this question of birds and pesticides by part of the Toxic Chemical and Wildlife Division at Monks Wood. The staff involved include 5 qualified scientists (2 population ecologists, 1 toxicologist and 2 chemists), helped by 5 scientific assistants. The team was set up in 1960, but intensive bird work was not started until 1962–3 and the full group was not assembled until 1963. This means that approximately 10 staff have been working on this problem for just over 5 years. The expenses involved per annum including equipment, travel, salaries, and additional chemical analyses completed on our behalf by the Laboratory of the Government Chemist in London, amount to some £30,000. Thus a total of something like £150,000 was spent up to the end of 1968.

The team first submitted evidence to the Government's Advisory Committee in 1961, which led to the voluntary ban on spring-sown seed-corn; further evidence was submitted for the 1964 report of the Advisory Committee, in which further bans on uses of aldrin, dieldrin and heptachlor were recommended, including a ban on dieldrin sheep-dip in 1965; a third submission of data has just been made, including work on DDT, for the current review of the organochlorine compounds being conducted by the Advisory Committee. As I have already pointed out, however, despite all this effort and expense by the Nature Conservancy alone, the problem has still not been completely investigated and it is now over 20 years since a persistent organochlorine insecticide was first introduced into agricultural use in Britain. Britain's contribution to the study of the possible harmful effects of persistent pesticides on wildlife has probably been as considerable as that of any other country and our results have been quoted throughout the world. I submit that without a professional team of trained scientists and considerable financial backing, the progress that has been made (in spite of many difficulties) would have been very considerably less. Possibly to the extent as to have been ineffective against the representations of the agricultural interests. It is not surprising that voluntary bodies such as the Royal Society for the Protection of Birds (R.S.P.B.), the British Trust for Ornithology (B.T.O.) and some of the County Naturalists' Trusts are now employing full-time (i.e. professional staff) including trained scientists. While this trend may not be welcomed by all amateur conservationists, because it almost inevitably alters the organisation of a voluntary body, it would appear to be essential if conservationists are to take a serious part in preserving the natural flora and fauna in the future.

I trust my third point, the need for co-operation, will already be evident from what I have said. This co-operation will be needed between official and amateur bodies, between the various amateur bodies, between sporting interests (such as the

Wild-fowlers' Association of Great Britain and Ireland, the British Falconers' Club) and conservation bodies. An important part of the work on organochlorine insecticides and birds was the national surveys of bird populations. These were an excellent example of co-operation between conservation bodies and their success proved to be an important factor in Britain's lead in the investigation of pecticide/wildlife problems. Derek Ratcliffe, a member of the Nature Conservancy staff, organised the B.T.O.'s national survey of the Peregrine (Ratcliffe *loc. cit.*); I, also a member of the Nature Conservancy staff, organised the B.T.O.'s national survey of the other common birds of prey (Prestt *loc. cit.*) and of the Great Crested Grebe (*Podiceps cristatus*), when it was suspected this species may have been affected by the organochlorine insecticides (Prestt and Mills, 1966). Most of the specimens of dead birds of prey used for autopsy and chemical analysis were found by B.T.O. or R.S.P.B. members and sent to the Monks Wood Experimental Station.

It is obvious, however, that co-operation and planning will be essential in many other aspects of conservation, e.g. it is urgent that as many details as possible are obtained about the present distribution of our flora and fauna, so that if any incidents do occur we can quickly evaluate the extent of the damage. It is also equally important that conservationists everywhere are alert to changes that may be occurring. While a few individual observers had noticed that locally Peregrines appeared to be decreasing, the significance of their observations was not realised. It was several years later, quite fortuitously, that the unprecedented decline in numbers and breeding success of this species came to light. Had the delay in its discovery been any longer, had the nucleus of the Conservancy's Toxic Chemical and Wildlife team not been in existence and had the basis of co-operation between the Nature Conservancy, the R.S.P.B. and the B.T.O. not already been in existence, it is very probable that the Peregrine and possibly the Sparrow-Hawk would now be extinct in Britain.

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A female kestrel, dead but still warm, was found on 2nd March 1969 in open pastureland near to Chomondley Hall, Chomondley, Cheshire. A *post mortem* revealed two short-tailed field voles and the left ramus of common shrew in the distended stomach; the liver was much split with congealed blood everywhere including one clot wedging the base of the trachea for half an inch. Ovulation not evident. Otherwise in prime condition.

Ellen Hazelwood

THE PARASITIC COPEPODS *ACHTHERES PERCARUM* NORDMANN AND *SALMINCOLA GORDONI* GURNEY IN YORKSHIRE

GEOFFREY FRYER

Freshwater Biological Association, Ambleside, Westmorland

Of the two parasitic copepods referred to here, both of which belong to the family Lernaeopodidae, *Achtheres percarum* was collected in Britain for the first time in 1954 in the River Colne, and in the Grand Union and Kennet and Avon Canals, all of which are in the Thames drainage area (Harding & Gervers, 1956). Since then it has been reported from Rostherne Mere, Cheshire [Rizvi — unpublished thesis, cited by Chubb (1965)] but not apparently elsewhere in this country. Because of the confusion in which it was involved (see below) it was, however, described and illustrated by Gurney (1933) in his monograph of the British freshwater Copepoda. The material he used came from continental Europe. The other species, *Salmincola gordoni*, was already known in Yorkshire and was indeed described from specimens collected in the River Rye (Gurney, 1933). It has since been reported from Scotland (Friend, 1939) where it had already been found prior to Gurney's work but had been erroneously reported (Scott & Scott, 1913) as *Achtheres percarum*, and has more recently been reported from the Isle of Man (Bruce, Colman & Jones, 1963). Outside the British Isles it is unknown. (It is possible that *S. heintzi* (Neresheimer) from Bavaria, which I regard as unrecognisable from existing descriptions, is closely related to this species.)

Material of *A. percarum* (Fig. 1) has now been obtained from three localities in Yorkshire, where it has evidently been established for some time as some of the specimens were collected as long ago as 1958. The two earliest collections came to me via Mr. A. Rennie of the Yorkshire Ouse and Hull River Authority and consisted of three specimens taken from a Perch (*Perca fluviatilis* L.) in Doe Park Reservoir, near Denholme (Nat. Grid. Ref. SE 077340) in June 1958, and several individuals taken from four Perch in the Lower Lake, Bretton Park (Nat. Grid. Ref. SE 285125) in August 1961. The overflow of Doe Park Reservoir goes to Harden Beck which joins the River Aire at Bingley. Bretton Park Lake lies between Clayton West and West Bretton and its overflow goes to the River Dearne, which joins the Don at Denaby, near Mexborough. The third locality is Lower Dunsforth (Nat. Grid. Ref. SE 450645) where three specimens were taken from two Perch in the River Ouse by Mr. C. Milner in July 1966 and came to me via Mr. E. W. Aubrook. All the material from these three localities consisted entirely of females.

No information is available concerning the site of attachment of the specimens in the first two localities, though the buccal cavity is the most usual, and all those from the Ouse were so located and gave rise to considerable inflammation. In all, 33 parasites were obtained from four fishes at Bretton Park, and the sample of fishes examined included one Perch which was apparently uninfected.

Like many highly modified crustacean parasites, *A. percarum* exhibits considerable variability of those parts of the body which are not concerned with functions such as attachment and feeding. This was illustrated by the material in the present collections which showed both inter- and intra-population differences. Many of the specimens from Bretton Park were particularly squat and fat. Such an individual is shown in Fig. 1a, which gives a general impression of the size and form of the animal and supplements Gurney's figures which are of more slender individuals.

Particularly noteworthy as it seems not to have been referred to before, was the variation in length of the maxillary arms (Mx). Distally these jointly give rise to a single median bulla (B) (see particularly Fig. 1, e and f) which is inserted into the host (Fig. 1, c and d). In some individuals the maxillary arms were very short and scarcely extended beyond the limits of the cephalothorax (Fig. 1, c): in others they were very long (Fig. 1, b and e), being considerably more than twice as long as the shortest in animals of approximately the same size, and extended far beyond the limits of the cephalothorax. Between these extremes were arms of various intermediate lengths. All the available specimens had been removed from the host so the exact site at which each was attached was not determined, but one suspects that this variation is of functional significance and that it will prove to be related to the position in which the parasite establishes itself.

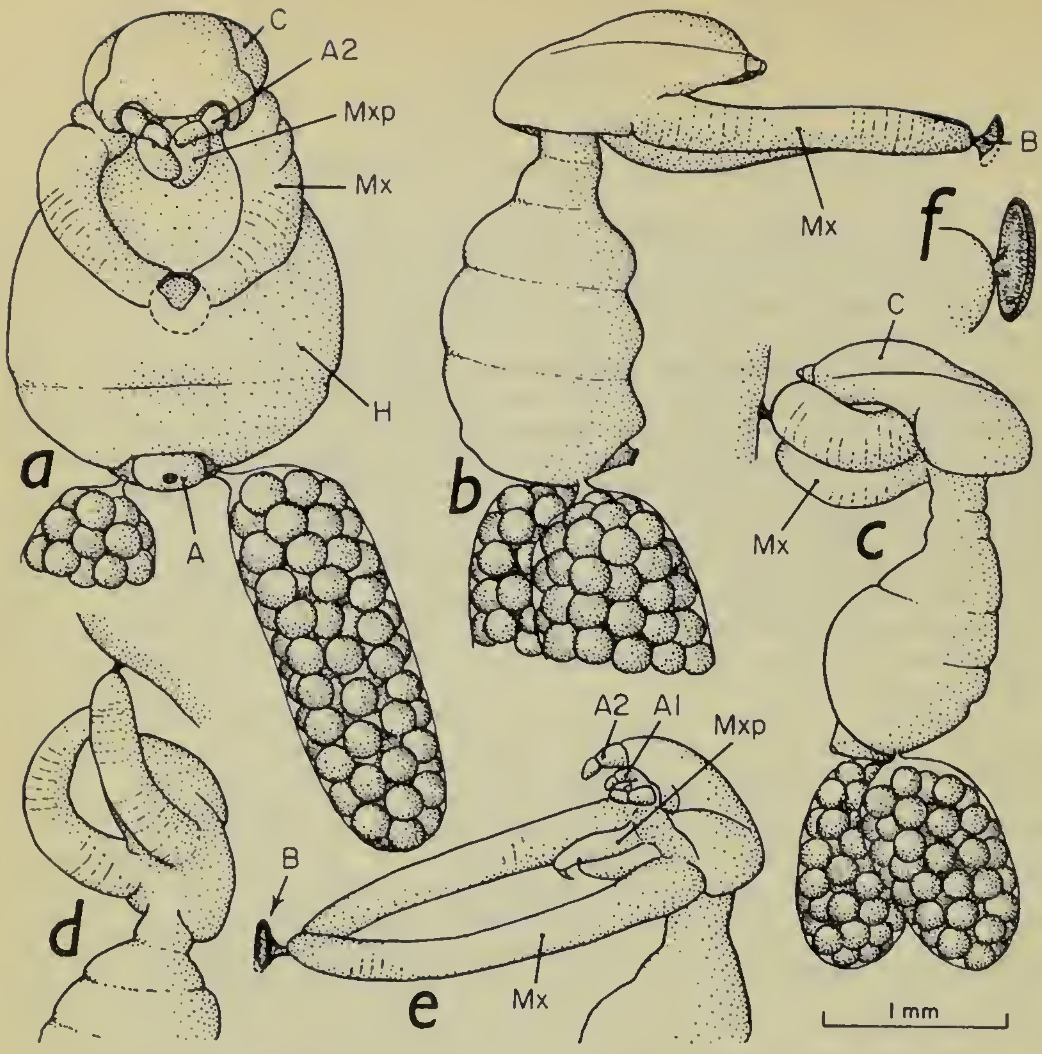

Fig. 1. *Achtheres percarum.*

a: Adult female ventral. b: Adult female lateral. Note the very long maxillary arms of this individual. c: An adult female, lateral, showing the way in which the bulla is inserted in the host. Note the very short maxillary arms of this individual. d: Another female with the bulla still in position in the host showing, in comparison with Fig. c, how the orientation of the maxillary arms differs in different individuals. e: Another female, seen ventro-laterally to reveal some of the appendages. Note the very long maxillary arms of this individual. f: The bulla.

Note: All specimens illustrated are from Bretton Park Lake.
Legend: A1: Antennule. A2: Antenna. Mx: Maxilla. Mxp: Maxilliped.
B: Bulla. C: Cephalothorax. H: Hindbody. A: Abdomen.

There is also apparently a considerable variation in size. Gurney (1933) gives the length of females as about 4 mm., Wagler (1937) as 4-5 mm., and Gusev (1962) as 3-5 mm. Most of the Bretton Park specimens, however, were only about 2.5 mm. in length, but two of the three specimens from the Ouse had a length of about 3 mm.

Some of the eggs of a specimen from the Ouse contained larvae which were beginning to emerge. These are copepodid larvae, for all naupliar stages are passed through in the egg.

Salmincola gordoni (Fig. 2) is known as a parasite of the Brown Trout, *Salmo trutta* L. and Grayling, *Thymallus vulgaris* (Nilsson) in the River Rye (erroneously called Ray in the original description) and from the Brown Trout in Scotland. It is also recorded from *Salmo trutta* in Port Erin Bay, Isle of Man, having been found there in

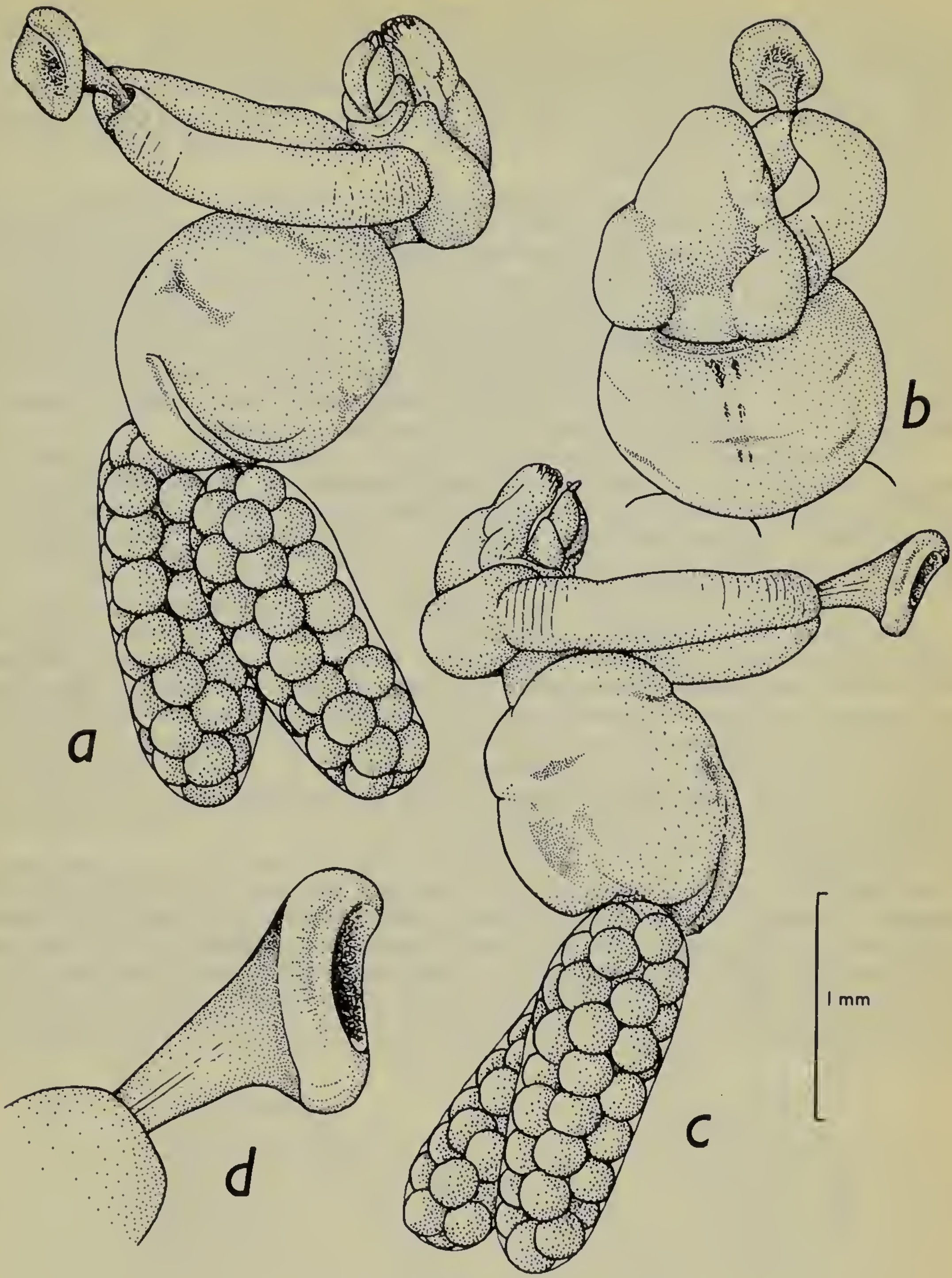

Fig. 2. *Salmincola gordoni.*

a: Adult female, lateral, from the left. b: The same, dorsal.
c: The same, lateral, from the right. d: The bulla.

1956 and 1958 (Bruce *et al.*, 1963). These individuals were presumably living on Sea Trout. Unless physiological races of this parasite exist, it would therefore appear that, like its close relative *S. salmonea* (L.), a parasite of the Salmon, *Salmo salar* L., and like its salmonid hosts, it is markedly euryhaline. Although some populations, such as those established on Brown Trout in regions far from the sea — such as the River Rye — are obviously permanently established in freshwater, these are undoubtedly of marine ancestry and presumably became permanent inhabitants of freshwater in post-glacial times.

I have seen a specimen of *S. gordoni* collected on Trout in the type locality in 1960 by Mr. A. Storey, and can now add two further localities, both in Yorkshire. One of these, the River Swale at Richmond, where a single specimen was taken by Mr. M. Ll. Parry from under the operculum of a Brown Trout, is not entirely surprising for both Rye and Swale ultimately join the Ouse. The other record appears distinctly puzzling at present, but this may be due merely to our ignorance of the habits and abilities of *S. gordoni.*

Among the parasites taken from Perch in Bretton Park Lake one was picked out as being different from the rest, and subsequent dissection and examination of its cephalic appendages showed that it was undoubtedly *S. gordoni.* In view of the fact that this species is otherwise known only as a parasite of salmonid fishes, its occurrence on Perch, which belongs to an entirely different family is surprising. However, as all the parasites were collected at the same time and place from only four host fishes, and as no-one could confuse a Perch with a Trout, the provenance of the host of this individual cannot be doubted. That it should co-exist with *A. percarum* when so few localities of either are known is also surprising and could perhaps indicate that these parasites are more widely distributed than is at present realised.

What seems possible is that Trout in the lake are infected with *S. gordoni* and that, although this appears to be unusual from what we know at present, the parasite is capable of attaching itself to and reaching maturity on the Perch. The specimen in question was an egg-bearing female. Preparation of this note was delayed for some time in the hope that further material might be forthcoming from Bretton Park, but this hope has not yet materialised.

In spite of their allocation to different genera these two parasites are similar in certain respects, and have been confused in the past. Indeed, as yet undescribed species may have been involved in the confusion in Scotland (Friend, 1939). The two can, however, be separated by unambiguous differences in the cephalic appendages and, on gross examination, by the absence of clear signs of segmentation of the hind body of *S. gordoni* (compared with distinct signs in *A. percarum*), and by distinct differences in the shape of the cephalothorax, that of *S. gordoni* being distinctly triangular when viewed dorsally (Fig. 2, b; Fig. 3, b) while that of *A. percarum* is more or less rectangular (Fig. 3, a). In specimens with an intact bulla, separation presents no difficulty (cf. Figs. 1, f and 2, d).

The addition of *A. percarum* to the fauna of the Yorkshire Ouse system brings to four the total number of lernaeopodid copepods now known to parasitise its fishes. In addition to the two species discussed here, *Salmincola thymalli* (Kessler) is recorded as a parasite of the Grayling in the River Rye (Gurney, 1933), where it still occurs, and *Tracheliastes polycolpus* Nordmann has been found in several places as a parasite of the Dace, *Leuciscus leuciscus* (L.) and Chub, *Squalius cephalus* (L.) (Aubrook & Fryer, 1965). Of these *A. percarum* and *Tracheliastes polycolpus* are probably comparatively recent introductions to the British fauna though it is just possible that the former has

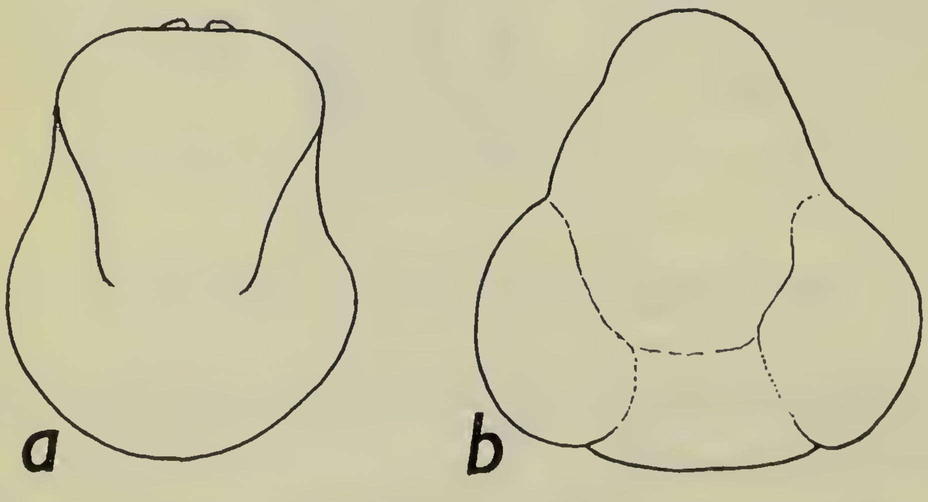

Fig. 3. Outlines of the cephalothorax of — a: *Achtheres percarum* and b: *Salmincola gordoni*, from above.

long been present in Britain but has escaped detection. A further species which may be added to the lernaeopodid fauna of the Ouse if search be made for it is *S. salmonea* (L.) which parasitises the Salmon and Sea Trout. Material of this or any other parasitic crustaceans would be much appreciated should it be collected by anglers or others.

I am grateful to Messrs. A. Rennie and E. W. Aubrook who placed most of the material studied at my disposal.

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NATIONAL BADGER SURVEY 1969

R. J. PAGET AND A. L. V. MIDDLETON

The *Naturalist* (Jan. 1968, 27) includes a short article contributed by one of us on the National Badger Survey. We feel it is now worthwhile to state the present position regarding badger setts in the West and East Ridings.

There are 122 setts now known in the West Riding and 67 in the East Riding and their characteristics of habitat and soil are as follows:

TABLE 1

HABITAT	WEST RIDING		EAST RIDING	
Deciduous Wood	53	(43·5%)	22	(32.8%)
Coniferous Wood	6	(5·0%)	11	(16.4%)
Copse	10	(8.2%)	2	(3·0%)
Hedgerow	14	(11.4%)	7	(10·5%)
Open field	13	(10.6%)	18	(26.9%)
Quarry	4	(3·3%)	5	(7·5%)
Moorland	9	(7·3%)	0	—
Others	13	(10.6%)	2	(3.0%)

SOIL	WEST RIDING		EAST RIDING	
Clay	73	(59·9%)	2	(3·0%)
Sand	21	(17.1%)	24	(35·8%)
Shale	10	(8.2%)	0	—
Limestone	3	(2.4%)	0	—
	11	(9.0%)	0	—
Coal	2	(1.7%)	0	—
Peat	2	(1.7)	0	—
Chalk	0	—	41	(61.2%)

The thirteen "others" in the West Riding are of interest and include three on railway banks, three on roadsides, five in riverbanks and two in the embankment of artificial waterways in the fenland around Goole (the only slopes in the area) and the two "others" in the East Riding are, one on an artificial waterway and one on a riverbank.

Of the 122 setts in the West Riding, 98 are occupied (80.3%) and 24 unoccupied (19.7%), comparing with 36 (53.7%) and 31 (46.3%) respectively in the East Riding.

An analysis of sett size is of interest, but it is difficult to assess the true size and the number of holes does not necessarily reflect the number of badgers in residence, since we have both seen a large number of badgers emerge from a "small" sett and a comparative few badgers from a "large" sett. In fact, we have the impression that human interference in the form of stopping, digging and gassing encourages the badgers in a given sett to open up further holes. There are many other factors in addition to interference which lead to an increased number of holes, such as local geology, sett age and site, etc.

A comparison of sett size is shown in Table 2.

TABLE 2

	WEST RIDING	EAST RIDING
Small (3 holes or less)	76 (62.3%)	21 (31.4%)
Medium (3 to 10 holes)	43 (35.2%)	36 (53.7%)
Large (10 or more holes)	3 (2.5%)	10 (14.9%)

Slope is a further parameter usually discussed in the study of setts and of the West Riding setts, 94 (77%) are on a slope, and of the East Riding setts 62 (92.5%). The remaining five East Riding setts on the flat are all in sand.

We thought a further point of interest would be an analysis of the woodland setts, into those on the wood edge (i.e. within 25 yards) and those deeper in the wood. (Table 3.)

TABLE 3

	WEST RIDING	EAST RIDING
On wood edge or in copse	45 (36.9%)	26 (38.8%)
Deeper in wood	22 (18.1%)	9 (13.4%)
Outside woods	55 (45.0%)	32 (47.8%)

We are still unable to comment on the distribution of the badgers in the Ridings since the badger density as recorded reflects more the locality of the recorders than the actual state of affairs as it probably exists. Large areas are still, sadly, without a single record and other areas obviously rich in badgers are represented by but a few records. The greatest numbers of setts at present are in the southern parishes of the county, some around Huddersfield (mainly due to the efforts of W. Stoney), and a few near Ripon (E. Kemp) and a few near Keighley (E. Ginz) and in the East Riding on the North Wolds.

More help is needed and it is hoped that any naturalist reading this article, knowing of a sett or setts, will contact the appropriate recorder concerned so that further progress may be made. Any reports of setts will be most gratefully used (and kept confidential if so required). We will gladly send guide sheets to aid recording to anyone interested in taking part or will call to see a sett by arrangement.

Mrs. S. Bell is at present analysing the North Riding setts. Having only recently taken on the post of recorder her report is not yet to hand, but she too would like to hear of further setts.

The Recorders concerned are: West Riding: R. J. Paget, Glebe Farm, Harthill, near Sheffield. East Riding: A. L. V. Middleton, Lund Farm, Lund, near Driffield, Yorks, E.R. North Riding: Mrs. S. Bell, 18 Rosedale Crescent, Guisborough.

A CENTURY OF BIRD PROTECTION

R. F. DICKENS

The first Act of Parliament for protecting wild birds (The Seabirds Preservation Act) was passed in 1869. At last year's joint Y.N.U.-Y.N.T. Conference at York University. E. M. Nicholson suggested that it would be appropriate to celebrate the centenary of the event by arranging a cruise to view the sea-bird cliffs at Bempton and Flamborough. It was the wholesale slaughter of the birds there which had inspired this first measure of bird protection. I am glad to say that the Ornithological Section of the Union readily took up the suggestion and great credit is due to Athol Wallis for carrying through the arrangements for the Centenary Cruise, from Scarborough on 8th June, 1969.

It is perhaps appropriate to recall at this time, that the start on bird protection legislation was made as a direct result of the efforts of Yorkshire naturalists. Regrettably the Union's minutes for the years 1866 to 1870 (or at least those for the West Riding Consolidated Naturalists as it was then called) are nothing more than dates, times and places of meetings. We have to look elsewhere for information about the significant moves during this period to protect birds.

How many present members of the Y.N.U. know, I wonder, that there is a tablet in the south wall of Priory Church, Bridlington, to the memory of "... *Henry Frederick Barnes-Lawrence, M.A., C.M.Z.S., Vicar of Bridlington* 1849–1874*; Rector of Birkin* 1874–1893, ... *In* 1868 *he founded the Association for the Protection of Sea-birds and secured the enactment of close-times throughout the British Isles* ..."

Starting from this clue, and looking through the Annals of Bridlington for the period, I find a reference for 17th October, 1868, to a letter in *The Times* from Rev. F. O. Morris saying that "a movement has been commenced in the East Riding for obtaining an Act of Parliament to stop the destruction of harmless gulls during the breeding season". Kittiwakes were the chief victims at Flamborough and Bempton of course, but it is clear from a later reference that the term "gulls" is used more or less as we would use "sea-birds".

In *Land and Water* about the same time a Commander Knocker says, "An Association has been formed at Bridlington to protect birds on British coasts during the breeding season". Among those supporting the Association were Mr. Walter Strickland, owner of Flamborough; Lord Londesborough, owner of Speeton; the Archbishop of York; Mr. C. Sykes, M.P.; Mr. W. H. H. Broadley, M.P.; the Hon. Admiral Duncombe; Lord Hotham; Col. Akroyd, M.P. and others. The secretaries were Rev. H. F. Barnes and Mr. T. Harland. When and why the former changed his name to Barnes-Lawrence I do not know. A list of rectors of Priory Church gives the name Barnes, as here. But the tablet to his memory bears the name Barnes-Lawrence and it was as Barnes-Lawrence that he was referred to at the Y.N.U. Annual Meeting of 1896 (see *The Naturalist*, No. 893 (April-June 1965), p. 38.

The Sea-birds Preservation Act of 1869, introduced into Parliament by Mr. Christopher Sykes, followed very quickly on the founding of the Association.

With all due respects to Barnes-Lawrence, I suspect that Rev. F. O. Morris was just as enthusiastic and energetic in 1868, in promoting the Association for the Protection of Sea-birds. He was certainly the more assiduous in his keeping of records of bird observations (see Nelson, *The Birds of Yorkshire*). From his letters to *The Times* it would seem that Morris may well have been the driving force. With this in mind, I followed the further lead to Nunburnholme Church, where "Francis Orpen Morris, B.A., formerly of Worcester College, Oxford" was rector from 1854–93. The tablet recording these facts also tells that the tower of the church was built to his memory in 1903 by his son who followed as rector. A tiny cross in the churchward marks the spot where F. O. Morris is buried close to the rectory which must have been a wonderful spot from which to watch birds for close on forty years.

As for Henry Frederick Barnes (or should we say Barnes-Lawrence) had he been alive still when I visited Bridlington Priory on 17th May, 1969, he would have been delighted by the Spotted Flycatchers and Collared Doves in the churchyard, the Swallow hawking over the green outside and by the Dunnocks nesting in the rambler rose on the Priory wall. Or, since he moved from Bridlington to Birkin, perhaps his pleasure would have been the greater, since Birkin is becoming a place more and more attractive to birds and bird-watchers alike. There would surely have been a sense of satisfaction too in the knowledge that his efforts of 1868–9 have been recognised and celebrated by the Centenary Cruise.

I hope that some local member of the Union may have the opportunity to delve further into the history of Bridlington's contribution to bird protection and record it more fully.

FIELD NOTES

Slavonian Grebe and Red-necked Grebe at Scarborough

As though by special request a Slavonian Grebe appeared in Scarborough harbour on Friday, 21st March 1969 and quite remarkably was joined during that day by a Red-necked Grebe, both birds kindly staying for the whole of the following day when the Vertebrate Section Meeting was being held in the town. Some fifty members of the society had, therefore, their trip to the meeting made doubly worthwhile.

Both birds were in winter plumage, the Slavonian Grebe showing the typical features of a black cap to the head, sharply demarcated just above the eye by the almost pure white of the cheeks and throat. The cap was darker in shade than the back and the flanks buffish, flecked with brown. The beak was dagger-shaped, dark in colour with a tiny pale tip.

The Red-necked Grebe was much browner on the head and the cheeks and throat were also difused with brown. Seen at the close quarters possible as it swam just below the piers the yellow of the base of the bill, along the edge of the upper mandible and round the base of the lower one was beautifully clear.

The Slavonian showed an interesting way of feeding, as on several occasions it was seen to lower its head just below the surface of the water and to paddle rapidly forward. It also dived for food in the normal manner.

Seen side by side the difference in size of the two species was clearly discernable, but several observers commented that the Red-necked appeared smaller than expected.

A. J. WALLIS

Dipper nesting in pot-hole

On 23rd May 1969, whilst examining a pothole entrance near Horton-in-Ribblesdale, Yorkshire W.R. with Mary Crook, we watched a Dipper (*Clincus clincus*) fly from a stream 15 yards from the pothole and down into the hole. Closer examination revealed a nest, about 12 feet down the vertical shaft, attached to the rock face. As the bird left it carried faecal sacs, indicating the presence of young in the nest.

Such a nest-site is unusual, and I know of no other similar case. It is especially interesting in that the young, on leaving the nest, would have to fly directly up for 12 feet or fall nearly 200 feet to the bottom of the pothole.

MALCOLM GREENHALGH

An Oniscomorph Millipede new to Yorkshire

Three specimens of the rare little millipede *Geoglomeris jurassica* Verhoeff were obtained from a soil core taken in Bramham Park near Wetherby in December last year. The site is one of the few existing areas of ungrazed grassland remaining on the Magnesian limestone, with a thick sward of *Brachypodium pinnatum* (L.) Beauv. and other grasses. Two of the specimens were female and one a juvenile.

In Britain the species is known from Wytham Wood, Berkshire, where it occurs sparingly in both woodland and grassland. It was first found by Prof. Overgaard Nielsen (who recognised it as new to the British fauna) and Mr. Charles Elton in material collected from a site very similar to that at Bramham Park, and was identified by J. Gordon Blower (Some new and little-known British Millipedes. *Ann. Mag. nat. Hist.*, Ser. 12, **10**: 497–508, 1957). It has since been found at Wytham in beech litter from two sites. It has also occurred in beech litter taken from Howe Wood, near Watlington, Oxon., by Dr. Kitty Paviour-Smith in March 1966, and there are other unpublished records for the Merlewood area of North Lancashire. Abroad it is only known from a handful of sites on the Jurassic limestone in the Jura district of Germany.

Males are unknown and the species appears to be parthenogenetic. It is small, unpigmented and blind, living well down in the soil, so that it is not likely to be found except by special search. It has no doubt been overlooked and its distribution may be fairly wide on limestone and chalk in this country.

I should like to thank the Hon. Mrs. Lane Fox for permission to take samples in Bramham Park, and Smiths Gore for their assistance.

S. L. SUTTON,
Department of Zoology, University of Leeds

THE BIOLOGY OF 'OLD DEN' IN THE HUMBER ESTUARY

P. R. MORGAN

The pebble shoal known as Old Den has always been associated with the peninsula of Spurn. Old Den took up its present site in 1610 from material washed through a breach of Spurn, and in the following 50 years grew in size to become an island with sand dunes and vegetation. During the next century the beheaded Spurn regained over a mile in length and began to overlap the site of Old Den. This had the effect of cutting off the material supply of Old Den which ceased to be an island and became a shoal (submerged bank) of smaller size. Spurn was breached again in 1849 and the washings were once again deposited on Old Den which increased in size, but remained a shoal. On this occasion the breach was filled artificially with chalk and the present site of Old Den has changed little since that time. It lies about half a mile off Spurn in the muddy Kilnsea Bay: it is totally immersed at high tide and only fully uncovered at low water levels of spring tide, when it has a length of 1,500 yards.

To a casual observer Old Den gives the impression of being a mere pile of pebbles rising from the midst of an extensive mudflat, a convenient spot, perhaps, from which fishermen may cast their lines, but little else. On close inspection, however, many animal species are to be seen on Old Den and it is in fact an area of great biological interest. At the present time the pebbles are liberally covered with barnacles (*Balanus balanoides*), and this forms the food of the common dogwhelk (*Nucella lapillus*), which is very common. The periwinkle, *Littorina littorea* which feeds on the algal coating of the pebbles is abundant. Edible cockles and mussels are also present but in much smaller numbers; these may also form the food of *Nucella*. Many delicate marine animals are present on the undersides of pebbles and need some seeking out; I have seen several coelenterates (*Plumularia, Actinia*, and *Sagartia*) at a low water level, and often polychaete worms live in the gravelly mud between the pebbles (*Nereis, Phyllodoce, Arenicola*). Living chitons (*Lepidochitona cinereus*), flat periwinkles (*Littorina littoralis*), limpets (*Patella vulgata*), buckies (*Buccinum undatum*), gapers (*Mya truncata*) and Baltic tellines (*Macoma balthica*) have also been found there, but in very small numbers. *Balanus balanoides* is not the only barnacle to have settled on Old Den. The sublittoral *Balanus crenatus* occurs at low water and the rare *Elminius modestus* settled briefly in 1965, but in competition with *B. balanoides* it was not long lived. Old Den does not drain completely when the tide recedes and many pools remain, which contain crustaceans. The shore crab, *Carcinus*, and the tiny pea crab, *Pinnotheres* are easy to find in the summer, and I have also seen the hermit crab, *Eupagurus bernhardus*; if one's eye is quick enough it is also possible to detect the shrimp (*Crangon vulgaris*) and the sandhopper (*Gammarus locusta*). The stream called 'Greedy Gut' which flows between the Old Den and the shore also harbours young fish; young dab, plaice and sometimes eel are to be seen there, and some fishermen set up fixed nets to catch them for food. The fish and molluscs in this area attract several species of predatory bird and these include the common and black backed gull and the oyster catcher.

My own studies on Old Den were centred on the small dogwhelk *Nucella lapillus*. *Nucella* is a small marine gastropod, commonly found on rocky-shores where it feeds on barnacles and mussels. *Nucella* feeds by drilling holes in its prey (mussels) with a ribbon-like tooth about half an inch long called a radula: this is housed within a fleshy manoeuvrable trunk-like organ called a proboscis. The radula apparatus not only drills the shells of its prey but also extracts the flesh from them. *Nucella* may take two to three days to drill a 1 mm. hole in the shell of a mussel and extract its flesh. Barnacles are not opened in this way but usually broken with the large fleshy foot: the meat is taken up through the proboscis. *Nucella* is such an efficient predator that on the open shore it may regulate the abundance of the barnacles and mussels on which it feeds and has been known to wipe out complete populations of its prey. Clearly there comes a point where over-active predation causes severe reductions in food supply and there is usually a balance between the numbers of prey and numbers of predators. On Old Den *Nucella* has been influential in controlling the numbers of several other animal species and there can be no doubt of its biological importance in this habitat.

Old Den provides rather an unusual ecological niche for *Nucella* for it rarely populates areas which are silted or gravelly, and its existence there is of great interest. *Nucella* takes on a remarkable mud-coloured camouflage on Old Den which serves to protect it from the predation of the gulls, and also, incidentally, from the eyes of human visitors. It has developed the extremely rare habit of feeding on cockles which it seeks over great distances and in the last four years has adjusted its behaviour and physiology several times to adapt to the ever-changing ecological conditions at Spurn.

Nucella was abundant on Old Den twelve years ago and lived alongside extensive populations of *Balanus* and *Littorina*. At this time the whelks presumably fed on barnacles — they exhibit little taste for winkles. In 1955 the North Eastern Sea Fisheries Committee planted a consignment of 15 cwt. of mussels on Old Den to test its potential as an area for growing mussels. These mussels did not survive, partly because of the muddy conditions and partly because of the predation by *Nucella*. Evidence of the activity of *Nucella* still remains in the form of shell gravel deposited on Old Den; the many mussels shells in this gravel were no doubt derived from the consignment and show signs of drilling. With so much food available, *Nucella* fed and multiplied and a large population must have existed in the late 1950's. It is not certain when the mussels were finally exterminated but by 1961 *Balanus* served *Nucella* as food again as it had done before the mussel implantation. There is good evidence that large populations of barnacles have existed on Old Den for many years and this organism probably represents the most stable food supply of *Nucella* in this unstable locality.

Large numbers of intertidal animals were killed all round the British Isles by the severe winter of 1962/63, and the Humber Estuary was no exception. Ice on the Humber scoured barnacles off Old Den during this winter and the few that remained at a low water position were covered with mud and thus killed in the winter of 1963/64. *Nucella* and *Littorina* were able to survive these conditions with greater success because they sought protection between the pebbles. Thus in the summer of 1964 the Old Den presented no obvious food for *Nucella; Balanus* and *Mytilus* (common mussel) had been wiped out, and for some unexplainable reason *Nucella* showed no interest in the abundant *Littorina*. The only other possible prey for *Nucella* was *Cardium edule*, the common cockle, washed on to the bank from the surrounding flats in tidal currents. *Nucella* rarely feeds on *Cardium* in nature because the cockle inhabits sandy or muddy places. The two species were able to co-exist on Old Den because it provided pebbles solid enough for the attachment of *Nucella*, together with mud and fine gravel into which *Cardium* could burrow. Although each cockle provided a very large meal, cockles on the Old Den were few and far between. *Nucella* were forced not only to recognise the new prey, but also to detect it, search for it, often over considerable distances and then to locate and attack it with efficiency. This involved a new approach to hunting, for previously *Nucella* feeding on barnacles literally sat on their prey; there was no need for an elaborate chemosensory mechanism for detecting prey from a distance, nor did the habit of preying on barnacles demand large feeding excursions or indeed the behaviour of drilling. Thus the survival of *Nucella* in these somewhat hostile conditions necessitated a considerable change in its habits. The population of *Nucella* survived because they accomplished these dramatic changes in behaviour.

In May 1965 a new population of barnacles settled over a limited area of the shoal which had been bare in 1964. *Nucella* in this area were themselves labelled with *Balanus* and began to feed on the new source of food because it was readily available. Within a few months the population of *Nucella* began to drift towards the new barnacle supply; the density per square meter increased in the barnacle-covered area and decreased in the area where *Nucella* still fed on cockles. The population of barnacles suffered a heavy mortality in 1965 as a result of predation by *Nucella*. In the following year (1966) a new settlement of barnacles occurred. This population extended far beyond the limits of the settlement of the previous year and enhanced the food supply for *Nucella*. Further settlements of barnacles occurred in 1967 and 1968, each extending the limits of the previous year. During 1965 and 1966 considerable numbers of *Nucella* still fed on *Cardium*, but while, on the one hand, barnacles extended, on the other, *Nucella* migrated into them, encountering more favourable feeding conditions. Fewer relied on *Cardium* and more fed on *Balanus* and the whelk population multiplied. At the moment (October 1968) it is difficult to find *Nucella* feeding on *Cardium*, but if severe conditions re-occur, *Nucella* must once again change its feeding habits to survive.

In experiments undertaken in the seawater aquarium at Hull University, *Nucella* accustomed to feeding on cockles exhibited behavioural patterns quite distinct from those feeding on barnacles: they were more active in their feeding habits and took larger numbers of barnacles, mussels and cockles than those previously fed on barnacles. Clearly *Nucella* living in conditions of food scarcity might have been expected to behave in this manner, but they showed no interest in winkles either in the field or in the laboratory. This is surprising for winkles are the most abundant potential food source for *Nucella* apart from barnacles on Old Den. One possible explanation is the hardness of the shell, and the relative speed of locomotion of *Littorina* as compared with the other victims of *Nucella*. *Nucella* feeding on cockles in nature were also more efficient at drilling holes in their victims than those previously fed on barnacles. Clearly they had gained experience of rasping under natural conditions when dealing with *Cardium*, whereas those fed on barnacles had no such experience. Experiments in the laboratory were conducted on the efficiency of drilling *Mytilus*, and at least one important finding resulted: *Nucella* previously fed on barnacles and therefore unaccustomed to drilling became as efficient at drilling *Mytilus* as those previously fed on *Cardium* after a period of 70 days experience. At the beginning of the experiment experienced *Nucella* took 3.46 days to drill and consume *Mytilus*; those inexperienced took 5 days. After 70 days, experienced *Nucella* took 2.85 days to drill and consume a mussel; those with experience from the experiment 2.28 days. This is indicative of 'learning', although more critical experiments would be necessary to establish this. It is best described as a behavioural adaptation. In a similar way *Nucella* previously fed on cockles became more efficient at dealing with barnacles after a few weeks experience in the laboratory. These experiments reveal the comparative rapidity with which *Nucella* can adjust its feeding habits to suit the food which is available.

Another laboratory experiment involved the choice of food by *Nucella*. *Nucella* previously fed on cockles on Old Den took them readily in the laboratory, whereas those fed on barnacles exhibited practically no interest in them. This result suggests in itself that cockles formed the food on which *Nucella* relied in the absence of barnacles. Exactly why the barnacle-fed *Nucella* did not at first feed on *Cardium* is not easy to explain. Clearly they did not recongise *Cardium* as food, and it is possible that the chemoreceptive mechanism was not adapted to respond to the substances released from cockles, whereas *Cardium*-fed *Nucella* had been conditioned in nature to respond to these substances. Curiously however all whelks, whether fed on barnacles or cockles on Old Den preferred mussels in laboratory conditions even although, at that time, mussels were not available for *Nucella* in the field. The explanation of this result is obscure and needs further investigation.

Previous to this discovery very little was known of the relationship between *Nucella* and *Cardium*. *Nucella* had been observed feeding on cockles in Lough Ine (Ireland) and in the River Crouch (Essex), but the behaviour had never been studied in detail. The predatory behaviour of *Nucella* was studied closely under laboratory conditions with a time lapse cine camera. These films showed that normally only one whelk in a sample of twenty or more actually drilled the cockle. This animal was termed a 'pioneer' and drilled through the shell in about 4 days. As soon as the 'pioneer' had penetrated the prey the cockle opened and the damaged tissue released body substances in higher concentrations than before, attracting many more individuals. These 'exploiters' took the flesh from between the valves of the prey whereas the 'pioneer' took the flesh through the site of its own boring. As many as 17 'exploiters' and one 'pioneer' have been seen feeding on a cockle on Old Den and on one occasion in the laboratory 36 animals were seen feeding on a single cockle. The method the 'pioneer' uses to seek its prey is of great interest. In still water *Nucella* is attracted to the odours released from *Cardium* and approaches its prey in a series of convoluted paths. This method is relatively inefficient when compared with the trails taken by *Nucella* in a current of water. In a current, *Nucella* orientates its body and moves directly upstream; if the locomotion is released by the chemoreception of cockle odour, the natural upstream course will lead it directly on to its prey. This current orientation behaviour occurs on the Old Den and explains the efficiency with which *Nucella* locates thinly scattered *Cardium*. Most of the cockles on the Old Den are drilled whilst buried in the substrate: these specimens show perforations in the upper posterior region of the shell close to the siphons. In contrast, cockles drilled in the laboratory on glass-bottomed tanks show perforations all over the shell. This evidence suggests that *Nucella* shows no specificity of boring site in freely exposed *Cardium*, but is forced to drill the uppermost area when it is buried in the substrate.

Clearly the inter-relationships described in this biological story only form part of a much more extensive and elaborate ecosystem on the Old Den. With so few cockles available on the shoal it is certain that *Nucella* competed for food with the gulls and the fishes resident in the same area. In such conditions many *Nucella* must have perished without finding food and others may have become vulnerable to the predation of gulls.

In conditions such as these, over-exploitation of a stock of prey often limits the abundance of predators. In 1965 the population of barnacles was almost annihilated as a result of over-exploitation by *Nucella*. Fortunately barnacles resettled in the following year, and the food supply of *Nucella* was maintained; it is clear, however, that if the barnacle population were not replaced annually, it would quickly be reduced to nothing and this, in turn, would limit the population of *Nucella*. Fortunately nature has a way of balancing itself and the annual increments of *Balanus* appear to suffice the needs of *Nucella*. This condition will probably be maintained until some catastrophe occurs and the ecological scales become unbalanced. Such an event occurred in the winter of 1962/63, and, as we have seen, it had a profound effect on the ecology of the area in the ensuing years.

It is clear that the environment on the Old Den at Spurn Point is a somewhat exceptional one for *Nucella*. Indeed, studies of the animal in the field strongly suggest that where barnacles are absent, the conditions for existence are extreme, and demand 'all the animal has to offer' in terms of behavioural adjustment. The success of *Nucella* on this pebble shoal reflects its remarkable capacity to withstand varying environmental conditions, and its ability to utilise the resources of the habitat in which it exists. Without this adaptability *Nucella* would have perished long ago on the ever changing environment of the Old Den.

A Key to the British species of Simuliidae (Diptera) in the Larval, Pupal and Adult Stages by **Lewis Davis.** Pp. 126 with 27 distribution maps. Freshwater Biological Association Scientific Publication No. 24, 1968. 10/-.

This is a really excellent little book. It is to be hoped that its publication will encourage both freshwater biologists and dipterists more interested in adult insects to study this very interesting family of flies. It supersedes John Smart's account of the family, published as No. 9 of the series 24 years ago. Comparison shows that the new publication has more than twice the number of pages of the old one and the content of information has increased by many times.

Dr. Davies had been carrying out critical taxonomic work on British Simuliidae for a number of years prior to his publication of 'The Taxonomy of British Black-flies (Diptera Simuliidae)' in *Trans. R. ent. Soc. London* **118,** 413-506. Largely as a result of this work the number of described British species has increased from 19 to 35 and this is given as the basic reason for the new publication. The opportunity has been taken, though, to write an account much better in all ways than the very useful 1944 publication. Five pages are devoted to a precise description of methods of study of Simuliidae. Thirty-one pages are devoted to a diagnostic and descriptive key to the larvae (one British species not yet known in the larval form). This section also carries notes on biology and distribution. The head capsules of all species described are figured, as are the hypostomii, anal sclerites, anal gills, mandibles and palps of most. Well illustrated sections of 13 and 31 pp. respectively deal with the pupae and adults.

A short bibliography is followed by distribution maps for 27 species prepared by the Biological Records Centre of the Nature Conservancy. The most obvious conclusion from these maps is that much more collecting is necessary before the British distribution of the majority of species is known even in broad outline. Seventeen species are shown as recorded in Yorkshire. Four species are known from single localities only — one *Simulium latigonium* Rubtzov, an East European species, is known only from a single locality in Westmorland.

Comparatively little is known of the biting and other habits of the adults in Britain and Dr. Lewis mentions no wild mammal as host to the females and birds only in general terms and relative to three species. No mention is made of Simuliidae feeding on flower nectar, from which, presumably, British species satisfy some of their energy requirements. It is, perhaps, a pity that just a little more biological information could not have been given.

Clearly, study of the Simuliidae is in an interesting stage for an entomologist with a liking for upland streams in particular and undeterred by the difficulties of identification. In meeting these difficulties Dr. Davies' keys and figures will be of the greatest assistance.

K.G.P.

STUDIES ON THE FUNGI ASSOCIATED WITH HEALTHY AND DEGENERATE BRACKEN (*PTERIDIUM AQUILINUM*). THE ROOT AND RHIZOME SURFACE MYCOFLORA

K. J. POWELL

In 1961, during a survey of Ilkley Moor, Yorkshire, by the Wharfedale Naturalists' Society, it was noticed that certain areas of bracken (*Pteridium aquilinum* (L.) Kuhn) were being grazed by sheep (Fidler, 1963). Garrett Jones (1961) observed persistent grazing of bracken by sheep on hills in South Wales. The grazing continued year after year, the animals biting the main stalk and stripping its lateral branches. In such grazed areas bracken completely disappeared in 3–4 years. Sheep do not normally graze bracken, indeed there is evidence that it can be positively harmful (Evans and Mason 1965).

The bracken in grazed areas on Ilkley Moor was degenerating in a manner apparently similar to that in South Wales and it was at first thought that the cause of the degeneration was grazing. However, Fidler (1963) records that there is no record of grazing on the moor until the latter half of the summer which suggests that the degeneration might be due to some other cause, the grazing simply hastening the degeneration process. Once bracken grazing begins the damage done to the young fronds in the 'hook' stage by trampling and biting could have a significant effect on later crops of the plant. Colonisation of the degenerate areas by crowberry (*Empetrum nigrum*) occurs. To date no causal organism has been isolated from the degenerating stock.

The purpose of this investigation was to determine the surface mycoflora of root and rhizome of healthy and degenerate bracken to discover what effect the degeneration had on the fungi growing on the root and rhizome surface. It was hoped that this investigation might throw some light on the cause of the observed degeneration.

NATURE OF SITE

In the particular area of degeneration chosen for this investigation, bracken grows on a north-facing slope near its altitude limit on the moor (1,000 ft.). The site is devoid of trees and the prevailing wind is from the west. The rhizomes occur in several layers down to a depth of approximately twelve inches.

METHODS

Bracken rhizomes with associated roots were dug from selected sites placed in polythene bags and taken into the laboratory. Samples of the degenerate bracken were taken from the chosen site, while those of healthy bracken were taken from widely-spaced areas (2–3 miles) in order to obtain a representative sample.

METHOD APPLIED TO ROOTS

Roots from various points along the rhizome were snipped off and placed in MacCartney bottles containing 10 ml. of sterile water, a maximum of five roots per bottle. A representative sample of roots was taken, ranging from light brown, young, active roots near the rhizome apex to dark brown, older roots some distance from the rhizome apex. Many roots had intact apices, especially young roots.

The roots were subjected to a serial washing in twenty changes of sterile water. The technique was similar to that suggested by Harley and Waid (Harley and Waid, 1955). Each bottle was shaken vigorously by hand for one minute. The roots were then transferred to a fresh bottle containing a further 10 ml. of sterile water. This process should remove all spores from the root surface and only mycelia living on the root surface should remain to be isolated. The validity of the technique was tested by plating 1 ml. aliquots from each washing into petri dishes containing molten but cooled agar, and the number of fungal colonies developing on the plates counted after three days. The findings, similar to Harley and Waid, were that twenty washings satisfactorily removed fungal spores from washed surfaces.

On completion of the washing, the roots were placed in petri dishes containing sterile water and cut with a sterile scalpel into 2 mm. fragments. The fragments were placed in petri dishes containing molten but cooled plain agar (2% w/v), five fragments per plate, and incubated at room temperature. Isolations of fungal hyphae were made on to Potato Dextrose agar slopes for identification. The majority of isolations were made between 48–72 hours after incubation, but the plates were kept for three weeks before discarding.

The procedure was identical for roots from healthy and degenerate bracken.

METHOD APPLIED TO RHIZOMES

Using two, sterile, embedded razor blades, 2 mm. cylinders from various points along the length of the rhizome, were cut. These were placed in McCartney bottles containing 10 ml. of sterile water, a maximum of five cylinders per bottle, and subjected to a serial washing as for roots.

The rhizome cylinders were then plated, a maximum of five per plate, as for roots and incubated at room temperature. Care was taken to ensure that there was sufficient agar in each plate to cover the rhizome material. Isolations were made on to Potato Dextrose agar slopes as for roots.

RESULTS

To obtain information on the ecology of fungi growing on the root and rhizome surfaces, the results for each fungus are expressed as percentage frequency. A record was kept of the total number of segments plated and the number of segments infected with each fungus.

FOR ROOTS

$$\%\ \text{frequency}\ \frac{\text{Number of root segments infected with fungus}}{\text{Total root segments plated}} \times 100$$

FOR RHIZOMES

$$\%\ \text{frequency}\ \frac{\text{Number of rhizome cylinders infected with fungus}}{\text{Total rhizome cylinders plated}} \times 100$$

The table shows the percentage frequency of fungi isolated from the root and rhizome surfaces of healthy and degenerate bracken.

	ROOT SURFACE		RHIZOME SURFACE	
	Healthy	Degenerate	Healthy	Degenerate
Aspergillus niger	—	—	—	2
Botrytis sp.	3	2	—	—
Candida sp.	11	—	1	—
Dactylaria sp.	7	5	11	2
Fusarium sp.	2	—	—	—
Mortierella sp.	2	—	8	2
Mucor sp.	4	—	5	2
Oospora sp.	3	—	—	—
Penicillium sp.	18	4	8	7
Phoma sp.	—	1	—	—
Sterile dark	43	14	40	23
Sterile grey	2	2	11	—
Sterile white	—	4	8	—
Other sterile fungi	—	—	—	12
Trichoderma viride	2	5	7	12
Total number of cultures	156	61	141	98
Total number of fragments	160	169	146	160

ROOT SURFACE FLORA

(a) *Roots from healthy bracken*

Many of the fungi isolated are considered to be "normal" root surface inhabitants, such as members of the Mucorales, species of *Penicillium, Trichoderma* and *Fusarium.* The predominance of sterile fungi on the root surface, particularly dark forms, is a distinctive feature. Cultures of these dark forms were exposed in plastic petri dishes to ultra-violet light. Cultures of malt agar in boiling tubes were inoculated with pieces of bracken rhizome bearing roots. The top of each boiling tube was covered with tin-foil kept in place with an elastic band. During succeeding days, the fungi in nearly all tubes spread from the agar on to the rhizome, completely covering the surface of the rhizome with a dark grey mycelium.

Microscopic examination of this felt showed the presence of mycelial strands, but no complex organisation as found in rhizomorphs and equally in none of the irradiated cultures were sporulating structures produced.

The presence of *Dactylaria* sp. on the root surface is of interest as this would not be considered a normal root surface inhabitant. Contrary to previous reports on predaceous fungi (Duddington, 1962), this fungus developed numerous rings of the constricting type in culture in the complete absence of nematodes.

(b) *Roots from degenerate bracken*

Sterile forms again predominate, particularly sterile dark forms. No members of the Mucorales were isolated. There was a reduction in the number of genera isolated and a reduction in the percentage frequency of all fungi as compared with those values from "healthy" bracken.

Total percentage frequency of fungi from roots of healthy bracken = 97.0
Total percentage frequency of fungi from roots of degenerate bracken = 37.0

The only exception of note was *Trichoderma* sp. which showed an increased frequency on the root surface of degenerate bracken.

RHIZOME SURFACE FLORA

(a) *Rhizomes of healthy bracken*

The similarity between the mycoflora of the rhizome surface and root surface is interesting if not surprising. Sterile dark forms again predominate and the high incidence of *Dactylaria* is of note.

(b) *Rhizomes of degenerate bracken*

The findings are similar to those for roots, a reduction in the number of genera and a reduction in the percentage frequency of the fungi isolated as compared with those values from "healthy" rhizomes, with again the exception of *Trichoderma viride*.

Total percentage frequency of fungi from rhizomes of healthy bracken = 99.0
Total percentage frequency of fungi from rhizomes of degenerate bracken = 62.0

DISCUSSION

While there have been many investigations into the root surface mycoflora of angiosperms, Dickenson and Pugh (1965), Kubikova (1963), Parkinson, Taylor and Pearson (1963), Taylor and Parkinson (1961), Peterson, E. E. (1958), no published data on the surface mycoflora of roots and rhizomes of pteridophytes particularly *Pteridium aquilinum* has been found.

Reddy (1959) in his studies of the rhizospheres of pteridophytes (*Equisetum* sp., *Lastrea* spp., *Pteris* spp., and *Cyathea* sp.) indicated that there was a distinct 'rhizosphere effect" similar to that of angiosperms. Species of *Penicillium, Aspergillus* and *Trichoderma* were frequently isolated, pathogenic forms, like species of *Fusarium* were infrequently isolated. Reddy did not distinguish between the root surface (inner rhizosphere) and the soil immediately adjacent to roots (outer rhizosphere). This investigation has been confined to the inner rhizospheres of roots and rhizomes of bracken. It is reasonable to believe that underground perennating organs like rhizomes will stimulate micro-organisms in their vicinity in a similar way to roots.

The change in the root and rhizome mycoflora in healthy and degenerate bracken is a prominent feature of the results. The degenerate bracken is lower than the healthy with a considerable reduction in leaf surface area. Another feature of degenerate bracken is its early maturing, autumnal effects such as yellowing or browning of the fronds occurring in many cases before the end of June. These factors will undoubtedly affect the carbohydrate levels in the rhizome and root, much less food reserves would be expected in the degenerate root and rhizome than in those from healthy bracken. What effect, if any, would this have on the root and rhizome surface mycoflora?

There is evidence of a qualitative and quantitative difference in the root surface micro-flora with differing carbohydrate levels, from the work of Eaton and Rigler (1946). They investigated the influence of carbohydrate levels and root-surface micro-flora on the susceptibility of cotton and maize plants to *Phymatotrichum* root rot. Different carbohydrate levels produced qualitative and quantitative changes in the root-surface micro-flora, some organisms tending to increase in number, others tending to decrease. These changes in the root-surface micro-flora affected the susceptibility of the cotton to *Phymatotrichum* root rot. At high carbohydrate levels the plants were less susceptible to root rot than at low carbohydrate levels. Eaton and Rigler suggested that at high carbohydrate levels there was inhibition of *Phymatotrichum* by antibiotics produced by other micro-organisms on the root surface. Changes in the microflora at low carbohydrate levels removed the anti-biosis, making the roots much more susceptible to attack by *Phymatotrichum*.

Bjorkmann (1944) found that strangulation of three-year-old pine plants, with a reduction in the amount of soluble carbohydrates in the roots, inhibited almost completely mycorrhizal development. The mycrorrhizal fungi did not become parasitic, they simply stopped colonising the roots.

The essence of Eaton and Rigler's work is that on the root surface there exists a complex community of micro-organisms in a state of equilibrium, not static but dynamic. Any factors which disturb this equilibrium can have unforseen and far-reaching consequences. In the case of cotton, differences in carbohydrate levels produced differences in the root surface micro-flora which affected the susceptibility of the host plant to *Phymatotrichum* root rot.

Other factors which can affect the root surface micro-flora and have been shown to be important in disease are soil type (Rishbeth, 1950), and the genetical constitution of the plant (Timonin, 1940).

Dealing with bracken degeneration, there is the possibility that a reduction in the root surface and rhizome surface mycoflora could make the bracken much more susceptible to soil-borne pathogens, but no fungus was isolated from the root or rhizome of degenerate bracken which would be likely to produce such marked effects as are seen in degenerating bracken. The major difference between root and rhizome surface mycoflora of healthy and degenerate bracken was one of quantity rather than quality.

It is a matter of conjecture whether the reduction in the mycoflora could be an initial cause of the degeneration, by making the roots much more susceptible to soil-borne pathogens or the reduction is an effect resulting from the degeneration by unknown causes. Without evidence to the contrary one is inclined to believe the second possibility, namely degeneration of bracken by causes unknown results in a decline in the fungal population on the root and rhizome surfaces. This decline could be due to a number of causes; a reduction in the carbohydrate levels in the root and rhizome for reasons given previously; changes in the root excretions, the roots of degenerate bracken having a reduced capacity for excretion, and differences in soil type in the healthy and degenerate areas. The possibility of differing genetical constitution of the degenerate bracken is unlikely to be of importance since healthy and degenerate areas adjoin and the line of demarcation is often distinct.

The present investigation, being confined to fungi, has found no organism which could be responsible for the bracken degeneration on Ilkley Moor. The cause of the degeneration may well not be fungal, other possible causal micro-organisms being bacteria or viruses.

The present methods of controlling and clearing land of bracken by burning and cutting are expensive and laborious. The identification of a definite causal organism producing degeneration and eventual disappearance of bracken would be invaluable if the organism could be introduced into healthy stock and, after introduction, result in clearance.

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THE INFILL OF MELTWATER CHANNELS ON THE NORTH YORK MOORS

I. G. Simmons
Science Laboratories, University of Durham

I

The narrow channels which are incised into the flanks and plateaux of the North York Moors have attracted considerable attention from geologists and geomorphologists. Kendall (1902) and Elgee (1912) considered them to be glacial overflow channels, spillways for glacial lakes, whereas the more recent work of Gregory (1962) has placed them in the category of subglacial meltwater channels. All authors have remarked upon the infill of the "slacks", the term by which they are locally known. Gregory (1962) confines himself to the clays and gravels which are found above the solid rock at the bottom of the features; both Elgee and Kendall however remark upon the organic peats and Erdtman (1928) in his pioneer pollen analytical investigations gives details of the peat stratigraphy at Ewe Crag Slack (NZ 695110).

II

During the course of a wider programme of pollen analytical and stratigraphic investigation of peats of the North York Moors (Simmons, 1969), the peat infill of two channels was considered in some detail. Both were on the margins of Egton High Moor and are marked on Gregory's (1962) map of these features. Moss Swang, at an altitude of approximately 575 feet (175 m.) runs sinuously due south from near Egton Bridge (805048) to Julian Park (813009); Lady Bridge Slack curves along the plateau flank, above Moss Swang but parallel to it, at approximately 700 feet O.D. (212 m.).

The infill of the channels was investigated by means of a hand-worked borer of the Macaulay Institute type (Jowsey, 1966), which takes a series of continuous cores. The gross stratigraphy of the organic deposits was found not to vary laterally: wood and wood peats formed a 'lining' to the channels (at Lady Bridge Slack this was impenetrable and it is possible that further organic deposits exist below the wood layer which forms the base of the profile investigated in detail), and above them red-brown fibrous peats with varying amounts of wood fragments formed the bulk of the deposit, turning to a different deposit in the top few centimetres. The character of this uppermost peat varied according to the present day surface vegetation.

During the course of the preparation of samples for pollen analysis many subfossil plant remains were recorded and a fairly complete picture of the peat stratigraphy can be built up at Moss Swang (806035). This consisted of:

(1) Contemporary rootlet peat 0–20 cm. Derived from the present vegetation dominated by *Erica tetralix, Eriophorum vaginatum* and *Sphagnum* spp.

(2) Red-brown fibrous peat with wood remains 20–140 cm. Mainly *Carex* rootlets, with frequent silt and charcoal fragments; also wood, mainly *Betula* but some *Frangula*. A *Betula* fruit is present at 135 cm.

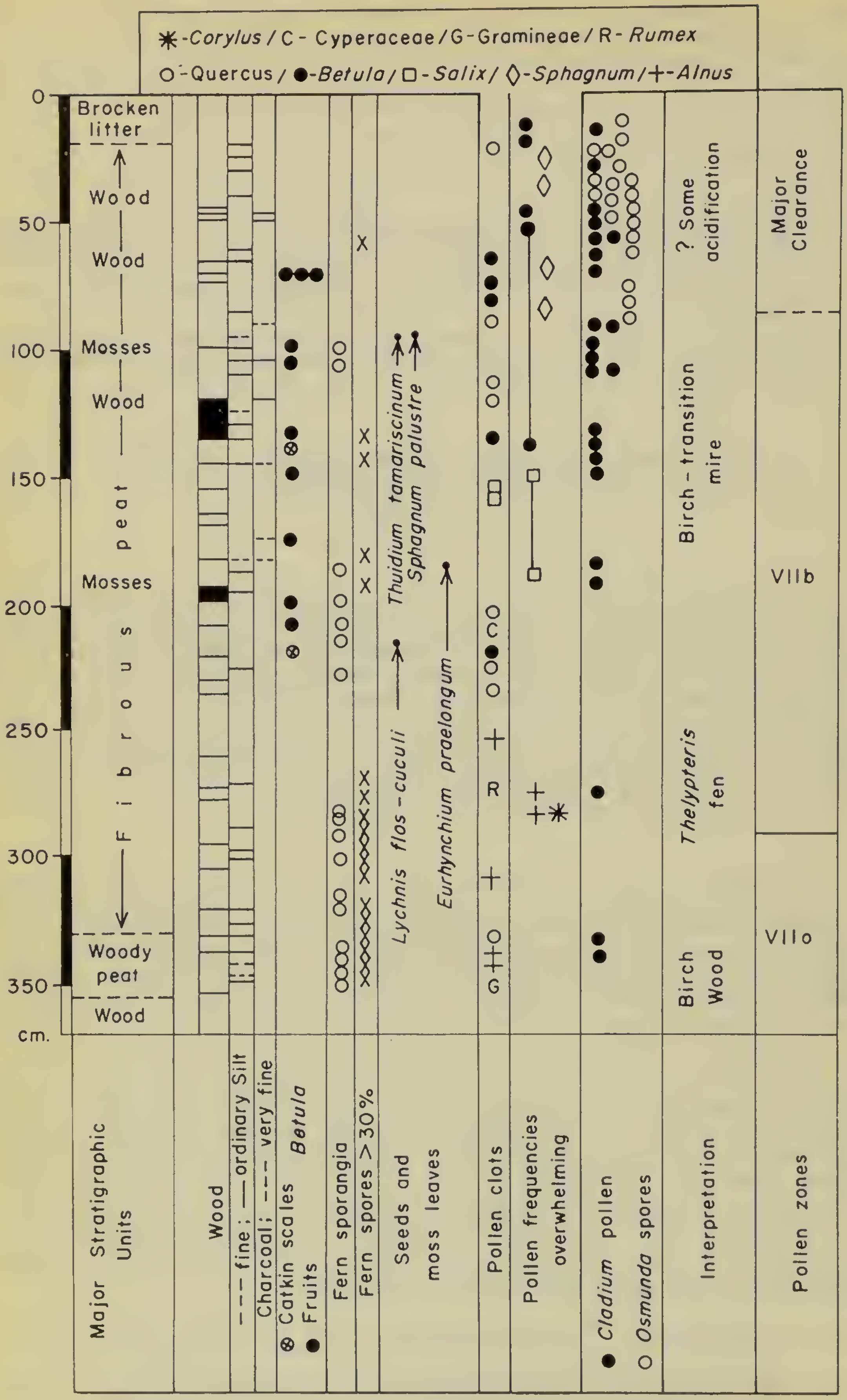

Fig. 1. Stratigraphy at Lady Bridge Slack.

(3) Red-brown fibrous peat, with few wood remains 140–430 cm. *Carex* rootlets with rotted fern pinnae. Two bands of mosses: at 165 cm. (*Sphagnum fimbriatum, S. recurvum, S. palustre* and *Acrocladium stramineum*) and 250 cm. (*Acrocladium giganteum*).

(4) Fibrous peat becoming woody 430–590 cm. *Betula* forms the bulk of the deposit near the base.

(5) Fine grey clay. At 590 cm.

The stratigraphy in a bore at Lady Bridge Slack (804018) consisted of:

(1) Contemporary peat 0–25 cm. Rhizomes and litter of bracken (*Pteridium aquilinum*).

(2) Red-brown fibrous peat with wood remains 25–220 cm. The fibrous peat is mainly fern pinnae and the wood *Betula* and *Salix*. Silt and charcoal are present, as are fruits of *Betula* and fern sporangia. Two bands of mosses: at 100 cm. (*Thuidium tamariscinum* and *Sphagnum palustre*) and 180 cm. (*Eurhynchium praelongum*).

(3) Fibrous peat with scattered wood remains 220–315 cm. Silt less frequent and charcoal absent but fern sporangia frequent.

(4) Amorphous peat 315–350 cm. Frequent wood remains and much silt; fern sporangia present throughout.

(5) At 352 cm. borer in impenetrable wood layer.

The remains found in this profile are summarised in Figure 1, which also tabulates the main features of the pollen analysis which relate to the development of the mire vegetation, i.e. overwhelming frequencies of a particular type and pollen "clots", which probably signify local presence of the contributing plants, together with the pollen and spores of certain mire species, e.g. *Cladium mariscus* (saw sedge) and *Osmunda regalis* (royal fern).

These details enable the development of the peat-forming mire in Lady Bridge Slack to be reconstructed. The chronology can be suggested in outline from the tree pollen (not tabulated here): customary pollen zones are given as part of Figure 1. The woodland present in the channel during pollen zone VIIa (and probably before) was overwhelmed by a rising watertable and the fibrous peats with fern remains which represent a fen (probably dominated by *Thelypteris palustris*) accumulated during late zone VIIa and in zone VIIb. The continuing nearby presence of woodland (probably on the sides of the channel) is shown by the "clots" of *Alnus, Betula* and *Quercus* pollen, and the long period of overwhelming *Salix* frequencies betokens a fringing willow development.

Above 200 cm. can be seen the normal process of ecological succession. In this case the fen appears to go over to birchwood: the evidence of autochthonous *Betula* growth is strong (fruits, wood, pollen frequencies) and mosses characteristic of the transition to *Betula* carr are present. The high base-status suggested by the fern fen is continued, exemplified by the presence of *Cladium*, and the carr stage is corroborated by *Osmunda*. Finally, the high frequencies of *Sphagnum* spores (together with some pollen types of acid-tolerant plants not plotted on the diagram) suggest a limited acidification of the surface, some of which has subsequently been removed by peat cutting, for which there is evidence at this site.

This sequence, of wood inundated by the development of a fen which then undergoes succession back to woodland, can also be traced in the Moss Swang profile. Here the base of the organic deposits represents zone IV and the inundation of the wood peat takes place at the boundary of pollen zones VI/VIIa (the Boreal-Atlantic Transition), when the climate is generally supposed to have become wetter. The succession to woodland is not quite so marked as at Lady Bridge Slack but some high *Betula* pollen and *Betula* wood indicate the trend; transition mire mosses are present also. Again, limited evidence of acidification is present near the surface and the cessation of peat growth appears (from internal evidence in the full pollen diagrams) to have occurred about the same time as at Lady Bridge Slack. Neither site shows any signs of the climatic change which culminated in about 400 B.C. Since this is a relatively dry part of upland Britain it is perhaps possible that the increased wetness at that time did not cross the threshold necessary for a change in vegetation type, although it may be noted that the Boreal-Atlantic Transition change apparently did so. An alternative explanation is that both sites had stopped accumulating peat before the zone VIIb/VIII change. If the major forest clearance phase (Figure 1: this is transferred from the full pollen diagrams and occurs in an equivalent position at Moss Swang) represents the incursion of the Bronze Age Urn people this suggestion is corroborated since their occupance would probably have predated the climatic change.

III

Descriptions of the fern-sedge fens which contributed the bulk of the deposits at both sites are not common in the literature. One of the closest parallels is described by Godwin and Clifford (1938) from Woodwalton Fen in Huntingdonshire. At this and adjacent sites the thickness of peat containing fern remains (identified as *Dryopteris thelypteris* = *Thelypteris palustris*) was much less and was generally the initial stage of an acid community. Nevertheless some species of mosses are common to both sites as is the presence of *Carex*. It is obvious that present-day peat-accumulating channel mires in the North York Moors, such as Fen Bogs in Newtondale, do not resemble the reconstructed fen since they are dominated by a *Sphagnum* carpet and have an acid-tolerant flora. A possible present-day equivalent of the fern-sedge stage, with *Cladium* present, is given by Bellamy (1967) for Strumpshaw in the valley of the River Yare, Norfolk. Here *Cladium* is in fact dominant but *Thelypteris palustris* is common also, as are three species of *Carex*, *Salix* spp., *Alnus*, *Lychnis flos-cuculi* and other species whose remains are represented at Lady Bridge Slack. The Strumpshaw site is in part of the main drainage channel of the Yare and possibly the slacks at one time had a more vigorous drainage than at present.

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TREE PLANTING ON FAIRBURN SPOIL-HEAPS

During the early part of 1969, volunteer parties of Wardens and other "friends of Fairburn" planted 500 pine, 1,000 alder, 500 sycamore and 2,000 birch on the slag heaps of the Nature Reserve. All these trees were supplied by the County authority who administer the reserve, but labour costs were obviated as a result of this splendid voluntary effort. Gifts of trees additional to the above were supplied by Sir William and Lady Worsley and the Castleford Inner Wheel. The Wardens themselves obtained a further supply of 1,500 trees from the Forestry Commission, these being larch and lodge-pole pine.

Planting, though not on this scale, has been proceeding for ten years and is already yielding not only a pleasanter background but habitats for additional species — e.g. Redpoll and Willow Warbler now breed. A pleasing feature of the planting programme this season, besides the scale of it, has been the help given by some of our younger visiting ornithologists and by one or two local schoolboys.

Other work has included the construction of rafts with Dutch-type duck-nesting baskets.

R. F. DICKENS

THE LEPIDOPTERA OF YORKSHIRE

(*continued from p.* 58)

Eupithecia centaureata Schiff. (Lime-speck Pug).

Widely distributed but seldom reported to be common except in the extreme south-east.

61. Spurn, often common as larvae and as imago; Selby, less common than formerly.
63. Little Horton near Bradford; Elland.
64. Harrogate, uncommon; Leeds; Selby district.

E. pulchellata Steph. (Foxglove Pug).

Fairly well distributed and probably to be found wherever there are plenty of Foxgloves.

E. linariata Fabr. (Toadflax Pug).

Widely distributed and seemingly commoner than the previous species. The larvae are usually freely obtainable wherever there is an established growth of wild toadflax.

E. tantillaria Boisd. (Dwarf Pug).

Not widely reported but probably has a wider distribution than the records suggest.

62. Buttercrambe Woods.
64. Bishop Wood; Harrogate, uncommon.

E. indigata Hubn. (Ochreous Pug).

Another insect which tends to be confined to the woods and is possibly overlooked as there are very few records.

61. Skipwith Common, used to be common but now seldom seen; Escrick Park, 1954.
62. Strensall Common.
64. Keighley; Ripon, one in a Pine copse on the Pateley Bridge road in May 1964; Bishop Wood, 20th August 1966.

E. venosata Fabr. (Netted Pug).

Local but recorded from widely separated areas. The moths are usually recorded singly but larvae are often found in numbers where there is a good growth of *Silene inflata* (Bladder Campion).

61. Shiptonthorpe, larvae in 1963; Spurn, larvae common in 1912, one moth in July 1948.
63. Beeston, larvae; Denby Dale, larvae in 1912; Elland; Tickhill, larvae in 1960.
64. Fairburn, larvae; Harrogate, larvae plentiful in 1965 and 1966; Leeds, 1967; Scholes, one in 1968.
65. Middleham, 1925.

E. pimpinellata Hubn. (Pimpinel Pug).

Not often recorded; unless fresh it is difficult to distinguish this insect from some of those which follow, it may therefore be taken more often than is realised. The larvae are however easily recognised.

64. Copgrove, larvae plentiful in 1964; Selby, at light in 1964 and 1965; York district.

E. distinctaria H.S. (Thyme Pug).

Not recorded since Porritt's List.

E. assimilata Doubl. (Currant Pug).

Not often reported but probably occurs in gardens and allotments on both currants and hops.

E. absinthiata Clerck. (Wormwood Pug).

Like the last species must also be commoner than the records suggest although in this case they are more numerous and indicate a very wide distribution throughout those areas which are worked regularly.

E. goossensiata Mab. (Ling Pug).

Recorded mainly from the low lying heaths, it certainly prefers heather growing among trees and has not been reported from the higher moorland areas of the Pennines.

61. Skipwith Common.
62. Langdale End, 1932; Strensall Common.

E. albipunctata Haw. (White-spotted Pug).

Local and not often recorded. The black form var. *angelicata* was recorded in Porritt's List and no doubt still occurs; if it has become as prevalent as the melanic forms of some other insects this could account for the scarcity of recent records as this form is difficult to separate from the melanic form of other species of the genus.

61. Everingham, 1924; Kilnsea, 1947; Skipwith, 1924; Selby, occasional larvae in recent years; Thixendale.
62. Linthorpe, 1915.
64. Askham Bog, 1966; Harrogate, uncommon; Leeds.

E. vulgata Haw. (Common Pug).

Widely distributed and often common, even in urban areas.

E. vigaureata Doubl. (Golden Rod Pug).

A scarce and local species, apparently confined to the eastern parts of the county.

61. Kilnsea, larvae in July 1950; Skipwith, 1903.
62. Pickering, between the wars; Scarborough, 1958.

E. trisignaria H.S. (Triple-spotted Pug).

Another species for which the only really reliable records are those of larvae.

63. Wadworth Wood, 1903.
64. Bishop Wood, larvae in 1956; Harrogate, larvae in 1962.

E. lariciata Frey. (Larch Pug).

Widespread and usually common in well-established Larch plantations. The melanic form outnumbers the type in the Pine Woods at Harrogate (64).

E. castigata Hubn. (Grey Pug).

Widely distributed and probably one of the commonest 'pugs' in the county. This species also has a melanic form which is usually more abundant than the type in industrial areas.

E. extensaria Frey. (Scarce Pug).

There are few British localities for this insect; the most northerly is at Kilnsea (61) where the larvae are often plentiful on *Artemesia maritima* (Sea Wormwood).

E. satyrata Hubn. (Satyr Pug).

Local and uncommon except in the Pickering area where it is well established; otherwise only occasional specimens have been recorded.

62. Pickering, in Gundale; Thornton Dale, 1964; Strensall, 1903.
63. Little Horton near Bradford.
64. Harrogate, uncommon.

E. succenturiata Linn. (Bordered Pug).

Not common and usually occurs as single specimens at light.

63. Little Horton near Bradford, 1952; Shipley, 1949–1951.
64. Leeds, 1958 and 1959; Selby district, a few up to 1964.
65. Boroughbridge district, larvae from *Artemesia vulgaris* (Mugwort) in 1963 and 1964.

E. icterata Vill. (Tawny Speckled Pug).

Widely distributed; moths are often recorded in small numbers, but larvae can be abundant on *Achillea millefolium* (Yarrow) late in the year.

61. Kilnsea, larvae 1948; Selby district, not uncommon.
62. Strensall Common, 1964.
63. Little Horton; Ilkley, 1953; Shipley.
64. Harrogate, larvae in 1965; Leeds, 1957.

E. haworthiata Doubl. (Haworth's Pug).

The original locality, given in Porritt's List as Wadworth Wood (63), has not been worked recently. Two new localities have been discovered.

63. Wentbridge, larvae plentiful in 1967.
64. Monk Fryston, larvae in 1954 and on several occasions since.

E. valerianata Hubn. (Valerian Pug).

The only recent records are from Grass Wood (64) where larvae have been taken frequently in recent years.

62. Great Ayton, 1913.
63. Wharncliffe near Sheffield, 1903.
64. Askham Bog, no recent records; Grass Wood, larvae frequently common.

E. plumbeolata Haw. (Lead-coloured Pug).

There is only one record since Porritt's List. The moths were taken flying over the food-plant *Melampyrum pratense* (Cow-wheat) at Miry Greaves near Skelmanthorpe (63) on 28th May 1916.

E. palustraria Doubl. (Marsh Pug).

There is only one record in the last twenty years. Some of the old records have not been followed up but around Selby it seems to have disappeared after 1933.

61. Selby area, until 1933.
62. Buttercrambe, 1944; Strensall, 1941.
63. Skelmanthorpe, 1916.
64. Askham Bog, one in 1963; Grassington, 1905.

E. tenuiata Hubn. (Slender Pug).

Very local and seldom taken, perhaps it is sometimes overlooked as it is inconspicuous both as larva and as imago.

61. Skipwith Common, one, 13th July 1963; Stamford Bridge, larvae in Sallow catkins in 1965.

E. inturbata Hufn. (Maple Pug).

The only record in Porritt's List was for Copgrove (64) in 1876. It's continued presence in this locality was established when larvae were beaten there in May 1963 and again in the following year.

E. fraxinata Crewe. (Ash Pug).

Widely distributed but not often common. Larvae beaten from Sea Buckthorn at Kilnsea (61) are probably referable to this species rather than to *E. innotata* to which they were originally referred. (See 1961, *Entomologist's Rec.*, 73: 210, 261, also 1963, *Entomologist's Gazette*, 14: 13.)

61. Kilnsea, larvae on Sea Buckthorn in 1960; Thixendale, one larva in 1965.
63. Denton Moors, larvae on Ash; Little Horton, 1967; Skelmanthorpe, 1910; Womersley, 1967.
64. Grassington, larvae; Harrogate, at light 1957 to 1965; Monk Fryston, larvae 1964; Leeds, 1959 and 1967.

E. nanata Hubn. (Narrow-winged Pug).

Widely distributed and often common wherever there is a good expanse of Heather, both on high and low ground.

E. abbreviata Steph. (Brindled Pug).

Not often recorded and then only from the Oak woods near Selby (64) particularly from Bishop Wood where it is well established.

E. dodoneata Guen. (Oak-tree Pug).

Not recorded since Porritt's List.

E. exiguata Hubn. (Mottled Pug).

There are only sporadic records over a fairly wide area.

64. Askham Bog, larvae 1966 and 1967; Bramham, 4th June 1950; Harrogate, 14th June 1958 and occasionally in subsequent years; Hetchell Crags near Leeds, 11th June 1968; Knaresborough, in Birkham Wood in 1962.

E. sobrinata Hubn. (Juniper Pug).

Most records are from gardens and built-up areas, suggesting that the species has been introduced with planted Junipers. All the records, except that from Swaledale, are from areas where Juniper does not grow wild.

62. Pickering, 17th June 1961.
64. Harrogate, 1965; Far Headingley, 1959 and 1960.
65. In Swaledale near Richmond, 1955.

E. pini Linn. (Cloaked Pug).

Only a single specimen was recorded in Porritt's List. A second specimen was recorded at Bolton near Bradford (63), taken at M.V. light on 14th June 1966 (*Naturalist*, 1968; 19). It must be presumed that it had been accidentally introduced into the area, possibly as a pupa.

E. subnotata Hubn. (Plain Pug).

Scarce, occurring sporadically with no evidence of being firmly established in any part of the county.

61. Kilnsea, one in July 1948.
64. Far Headingley, 10th July 1960; Selby, two in 1947.

E. subumbrata Schiff. (Shaded Pug).

Very local but well established in at least one locality and might well be found elsewhere in the Wolds.

61. Garrowby, before 1940; Thixendale, at M.V. light 5th July 1962, subsequently the larvae have been found to be not uncommon there on the flowers of Scabious.

Gymnoscelis pumilata Hubn. (Double-striped Pug).

Very uncommon with only three records in the last twenty years.

64. Harrogate, February 1965; Malham Tarn, July 1968; Leeds once.

Chloroclystis coronata Hubn. (V Pug).

The comparatively small number of widely scattered records suggest that this pretty little moth is frequently overlooked in spite of being one of the more easily identifiable 'pugs'.

63. Frizinghall near Bradford, 23rd September 1965; Chevet near Wakefield, 9th June 1945; Walton Hall Park near Wakefield, 1918.
64. Harrogate, 13th September 1960; Temple Newsam, 4th July 1941; Leeds, one in 1962.

C. rectangulata Linn. (Green Pug).

Widely distributed and often quite common, particularly in built-up areas where fruit trees are grown in any quantity.

Anticollix sparsata Treits. (Dentated Pug).

Very local but often abundant where it occurs; its presence depends on the existence of its only known food-plant *Lysimachia vulgaris* (Yellow Loosestrife).

63. Thorne Moor, formerly taken regularly but not in recent years.
64. Askham Bog, well established and sometimes plentiful; Selby district, in a damp wood, 1959 to 1963.

Abraxas sylvata Scop. (Clouded Magpie).

Widely distributed and sometimes plentiful where Wych Elm is well established. No notable variations have been recorded in recent years.

62. Hutton-le-hole, 1937; Scarborough, in Raincliffe Woods in 1967.
63. Doncaster, in the Red House district; Edlington Wood; Elland; Halifax; Wentbridge.
64. Baildon; Bishop Wood; Bolton-by-Bowland; Grassington, 1952; Knaresborough, at Scotton Banks; Scarthingwell; Selby district.

A. grossulariata Linn. (Magpie).

Not as common as formerly but still widely distributed. It occurs both in gardens and in the open country where it feeds on Sloe. Var *varleyata* has been bred in recent years from specimens taken in the Bradford area (63).

Lomaspilis marginata Linn. (Clouded Border).

Widely distributed and sometimes plentiful among Sallow and Aspen.

61. Skipwith Common.
62. Buttercrambe Wood; Strensall Common.
63. Little Horton near Bradford; Wentbridge.
64. Askham Bog; Bishop Wood; Harrogate; Kirkham Abbey; Knaresborough; Breary Marsh, Leeds.

Ligdia adustata Schiff. (Scorched Carpet).

Not often taken and now very local, being confined entirely to its food-plant the Spindle Tree; it has only been reported in one locality in the last thirty years.

62. Pickering, in Gundale in 1953 and 1954.
63. Edlington Wood, 1917; Wadworth Wood, one in the early 1930's.
64. Grassington, included in a list for Grass Wood published in 1932.

Perconia strigillaria Hubn. (Grass Wave).

Very local and not as widely distributed as might be expected in view of the range of heaths and moors in the county.

61. Allerthorpe Common, still plentiful in spite of recent afforestation.
62. Danby, at Ewe Crag Slack in 1903; Hackness, 1936; Strensall Common.
64. Ilkley, before 1907.

Aspitates gilvaria Fabr. (Yellow Belle).

This was added to the Yorkshire List when S. M. Jackson took a solitary female at Kilnsea (61) on 15th June 1951. Fertile ova were obtained and moths bred but no other wild specimens have been reported.

(*to be continued*)

ENTOMOLOGICAL MEETING AT SKIPWITH COMMON

25th May 1968

P. SKIDMORE

Despite the rather dismal weather prevailing during the period when this meeting took place, it was tolerably well attended for nine members turned up. Though fairly warm, it was dull all day and windy. The interests represented at the meeting were wide and hence a fairly comprehensive list of species was obtained. By the nature of the terrain it is not easy to arrange the species purely ecologically and hence the following list is arranged more or less in the system of Kloet & Hincks (1945).

Initials refer to following collectors: T.F. — T. Ford; A.W. — A. Wright; J.H.F. — J. H. Flint; J.F. — Jeremy Flint; P.S. — P. Skidmore; E.W.A. — E. W. Aubrook.

PSOCOPTERA:

Amphigerontia contaminata (Steph.); adults common (P.S.).

ODONATA:

Pyrrhosoma nymphula (Sulzer); adults common.

HEMIPTERA:

Elasmostethus interstinctus (L.); adults sparingly on birch.
Elasmucha grisea (L.); adults sparingly on birch.
Cymus glandicolor Hahn; adults common.
Anthocoris nemoralis (F.); adults common.
A. confusus (Reuter); adults common.
Monalocoris filicis (L.); adults common.
Hebrus ruficeps (Thomson); one adult (J.H.F.).
Notonecta glauca L.; several in dyke (J.F.).

MEGALOPTERA:

Raphidia xanthostigma (Schummel); one adult beaten from willow (T.F.).

NEUROPTERA:

Micromus variegatus (F.); adults sparingly (P.S.).
Hemerobius nitidulus F.; adults on pines (E.W.A.).
Kimminsia nervosa (F.); adults on pines (E.W.A.).

LEPIDOPTERA:

Micropteryx calthella (L.); adults common on *Ranunculus*, etc.
Hypocrita jacobaeae (L.); adults sparingly.
Brephos parthenias (L.); few larvae (T.F.).
Ectropis punctularia (Hb.) (T.F.).
Ematurga atomaria (L.); adults common.
Hybernia defoliaria (Clerck); larvae numerous (T.F.).
H. aurantiaria (Esper); larvae (T.F.).
Phigalia pedaria (F.); larvae.
Campaea margaritaria (L.); larvae (T.F.).
Lycaena phlaeas (L.); adults sparingly.
Pieris brassicae (L.); adults sparingly.
P. napi (L.); adults sparingly.
Macrothylacia rubi (L.); one larva (A.W.).
Trichiura crataegi (L.); larvae (T.F.).
Psychid cases on heather (P.S.).
Eulia ministrana (L.); adults common on birches (P.S., J.H.F.).

COLEOPTERA:

Bembidion lampros (Hbst.); adults on paths, etc.
Acupalpus dubius Schilsky; adults sparingly in Sphagnum.
Pterostichus minor (Gyll.); adults sparingly in Sphagnum.
P. diligens Sturm.; adults sparingly in Sphagnum.
Agonum gracilis (Gyll.); adults sparingly in Sphagnum.
Noterus clavicornis Deg.; adults in dyke (J.F.).
Hydroporus lineatus (F.); adults in dyke (J.F.).
H. planus (F.); adults in dyke (J.F.).
H. dorsalis (F.); adults in dyke (J.F.).

Agabus sturmii (Gyll.); adults in dyke (J.F.).
A. bipustulatus (L.); adults in dyke (J.F.).
Ilybius ater (Deg.); adults in dyke (J.F.).
I. fuliginosus (F.); adults in dyke (J.F.).
I. obscurus (Marsham); adults in dyke (J.F.).
I. guttiger (Gyll.); adults in dyke (J.F.).
Rantus exsoletus (Forster); adults in dyke (J.F.).
Dytiscus marginalis L.; adults in dyke (J.F.).
Acilius sulcatus (L.); adults in dyke (J.F.).
A. canaliculatus (Nic.); adults in dyke (J.F.).
Athous haemorrhoidalis (F.); adults common.
Corymbites incanus (Gyll.); adults common.
Rhagonycha lignosa (Ml.); adults common on oaks.
Adalia 10-punctata (L.); adults abundant.
A. bipunctata (L.); adults abundant.
Calvia 14-guttata (L.); adults on birches.
Propylea 14-punctata (L.); adults common.
Anaspis rufilabris Gyll.; adults common.
A. maculata Geoffroy; adults common.
Lochmaea suturalis (Thoms.); adults abundant on *Calluna*.
Chalcoides fulvicornis (F.); adults numerous on willows.
Deporaus betulae (L.); adults common on birches.
Phyllobius argentatus (L.); adults common on bushes.
P. pyri (L.); adults abundant.
Polydrosus cervinus (L.); adults common.
Apion ulicis (Forster); adults abundant on gorse.
Sitona regensteinensis (Hbst.); adults numerous on gorse and broom.
Coeliodes rubicundus (Hbst.); adults sparingly on oaks, etc.
Cidnorrhinus 4-maculatus (L.); adults abundant on nettles.
Ceuthorrhynchus pollinarius (Forster); adults common on nettles.

HYMENOPTERA:

Dolerus gonager (F.); adults common.
Ametastegia albipes (Thoms.); one female (P.S.).
Aglaostigma fulvipes (Scop.); adults sparingly.
Selandria serva (F.); one adult amongst Caricetum.
Biorrhiza pallida (Oliv.); new galls on oak.
Bombus hortorum (L.); adults at sallow, etc.
Apis mellifera L.; adults at sallow, etc.

DIPTERA:

Prionocera turcica (F.); adults frequent; pupae in dykes.
Tipula variipennis Mg.; adults sparingly.
Limnophila meigeni Verrall; adults in numbers.
Bibio marci L.; adults common.
Dilophus febrilis (L.); adults abundant.
Dolichopus popularis Wd.; adults common.
Lonchoptera lutea Pz.; adults common.
Eristalis sepulchralis (L.); adults sparingly.
Helophilus lineatus (F.); one adult in Caricetum.
Neoascia dispar (Mg.); adults common.
Syrphus lunulatus Mg.; one adult.
S. ribesii (L.); adults common.
Renocera pallida (Fallen); adults sparingly along dyke (P.S.).
Tetanocera ferruginea Fallen; adults sparingly in damp places.
Hydromyia dorsalis (F.); one adult by dyke.
Amaurosoma armillatum (Zett.); adults common.
Chaetosa punctipes (Mg.); adults numerous.
Scatophaga squalida Mg.; adults common.
Degeeria collaris (Fallen); adults common on birches.
Musca autumnalis Deg.; adults common.
Morellia simplex (Lw.); adults numerous.
Hydrotaea dentipes (F.); adults common.

Trichopticoides decolor (Fallen); females common.
Thricops semicinereus (Wd.); adults common.
Phaonia variegata (Mg.); adults sparingly on tree trunks.
Hebecnema affinis Malloch; adults common.
H. umbratica (Mg.); adults common.
Hydrophoria conica (Wd.); adults sparingly in wooded parts.
Hylemyia strigosa (F.); adults abundant in wooded parts.

ENTOMOLOGICAL MEETING AT HAW PARK
7th SEPTEMBER 1968

P. SKIDMORE

Due to the somewhat inclement weather this meeting was poorly attended, only four Yorkshire entomologists, Mr. and Mrs. J. H. Flint, P. Skidmore, and R. Crossley, and two Lancashire men, Mr. L. N. Kidd and Mr. B. Clayton, braved the elements to examine the fauna of Haw Park. However, an extraordinarily wide range of interests were represented and hence the list of species recorded was quite comprehensive. The most interesting records were the result of Mr. L. N. Kidd's activities amongst the fungus gnats — a much neglected group of flies in which Mr. Kidd has taken a particular interest. Five fungus gnats were new to Yorkshire as also was the sawfly *Stauronematus compressicornis* of which a larva was beaten from *Populus tremula* by Mr. Flint. These new records, and some additional new vice-county records resulting from this meeting have already been published in the Y.N.U. Annual Report for 1968 (*Nat.,* 1969, 13-16). The area worked at Haw Park was the woodland adjacent to the canal, where the dominant trees are oak, birch and larch with a few aspens and a dense scrub of various willows and hazel. The list is arranged ecologically.

On oaks:
Caecilius flavidus (Steph.) (Psocoptera); common (P.S.).
Megacoleum infusum (H.-S.) (Hemiptera); one specimen (J.H.F.).
Dasycera sulphurella (F.) (Lepidoptera); larvae beneath bark (P.S.).
Andricus fecundator (Hart.) (Hymenoptera); galls common (P.S.).
Neuroterus quercus-baccarum (L.) (Hymenoptera); galls common (P.S.).
Chrysopa flava (Scop.) (Neuroptera); adults common (P.S.).
Hemerobius lutescens F. (Neuroptera); adults common (P.S.).
Micromus variegatus (F.) (Neuroptera); few adults (P.S.).

On willows:
Idiocerus confusus Flor. (Hemiptera); adults common (J.H.F.).
Chilocorus renipustulatus (Scriba) (Coleoptera); several adults on one tree (P.S.).
Chalcoides fulvicornis (F.) (Coleoptera); adults common (J.H.F.).
Rhynchaenus salicis (L.) (Coleoptera); adults common (J.H.F.).

On aspen:
Laothoe populi (L.) (Lepidoptera); one larva (R.C.).
Idiocerus populi (L.) (Hemiptera); few adults (J.H.F.).
†*Stauronematus compressicornis* (F.) (Hymenoptera); one larva (J.H.F.).

On hazel:
Lithocolletis stettinensis, von Nic. (Lepidoptera); mines in leaves (P.S.).
Malacocoris chlorizans (Pz.) (Hemiptera); adults in numbers (J.H.F., R.C.).

On alder:
Neomecomma bilineatus (Fallen) (Hemiptera); adults on one tree (J.H.F.).

By sweeping herbage layer in woods:
Forficula auricularia L. (Dermaptera); common (P.S.).
Ceramica pisi (L.) (Lepidoptera); larvae sparingly (R.C.).
Philaenus leucophthalmus (L.) (Hemiptera); adults abundant.
P. lineatus (L.) (Hemiptera); adults abundant.
Allygus mixtus (F.) (Hemiptera); adults (J.H.F.).
Cicadula quadrinotata (Boh.) (Hemiptera); adults (J.H.F.).
Macrosteles viridigriseus Edw. (Hemiptera); adults (J.H.F.).
Cixius nervosus (L.) (Hemiptera); adults (J.H.F.).
C. distinguendus Kirsch. (Hemiptera); adults (J.H.F.).
Aphalara exilis (W. & M.) (Hemiptera); adults abundant on Rumex (P.S.).
Stenodema calcaratum (Fallen) (Hemiptera); adults numerous (J.H.F., R.C.).
Phytocoris pini Kirsch. (Hemiptera).

Lygocoris pabulinus (L.) (Hemiptera).
Dicyphus errans (Wolff.) (Hemiptera).
Blepharidopterus angulatus (Fallen) (Hemiptera).
Monalocoris filicis (L.) (Hemiptera); adults abundant on ferns.
Adonia variegata (Gz.) (Coleoptera).
Adalia bipunctata (L.) (Coleoptera); adults common.
A. decimpunctata (L.) (Coleoptera); adults common.
Propylea 14-punctata (L.) (Coleoptera); adults common.
Scymnus nigrinus Kug. (Coleoptera); one adult under conifers (J.H.F.).
Coccinella 11-punctata (L.) (Coleoptera); adults common.
Otiorrhynchus singularis (L.) (Coleoptera); adults in numbers (P.S.).
O. sulcatus (F.) (Coleoptera); adults.
Strophosomus melanogrammus (Forst.) (Coleoptera); adults common.
Tipula paludosa Mg. (Diptera); adults abundant (P.S.).
Limonia maculata (Mg.) (Diptera); adults common (P.S.).

The following fungus gnats were taken by L.N.K.:

Bolitophila hybrida (Mg.); *Macrocera vittata* Mg.; *M. fasciata* Mg. (*); *Mycomyia duplicata* Edw. (†); *M. incisurata* (Zett.); *Boletina gripha* Dzied. (*); *Exechia dorsalis* (Staeger) (†); *E. separata* Lundstroem (†); *E. nigroscutellata* Landrock (†); *E. subulata* Winnertz; *Allodia ornaticollis* (Mg); *A. sericoma* (Mg.) (*); *Cordyla fasciata* Mg. (†); *C. flaviceps* (Staeger); *Mycetophila fungorum* (Deg.); *M. lineola* Mg. (*); *M. luctuosa* Mg. (*); *M. signatoides* Dzied.

Argyra leucocephala (Mg.) (Diptera); adults common (P.S.).
Lonchoptera lutea Pz. (Diptera); adults common (P.S.).
Calliopum aeneum (Fallen) (Diptera); adults (P.S.).
Neuroctena anilis (Fallen) (Diptera); few adults about rotting fungi (P.S.).
Opomyza germinationis (L.) (Diptera); adults abundant (P.S.).
Scatophaga stercoraria (L.) (Diptera); adults abundant (P.S.).
Helina impuncta (Fallen) (Diptera); adults abundant (P.S.).
H. ciliatocosta (Zett.) (Diptera); few adults (P.S.).
Pycnoglossa flavipennis (Fallen) (Diptera); adults on *Pteris* (P.S.).

On conifers:

Aphidecta obliterata (L.) (Coleoptera); adults (J.H.F.).
Harmonia 4-punctata (Pont.) (Coleoptera); one adult (J.H.F.).

On *Umbelliferae* and other flowers, and foliage:

Pararge megera (L.) (Lepidoptera); adults common.
Pieris napi (L.) (Lepidoptera); adults common.
Lycaena phlaeas (L.) (Lepidoptera); adults sparingly (P.S.).
Stigmella anomalella (Gz.) (Lepidoptera); two leaves of a rose bush bore the unmistakable mines of this moth (P.S.).
Syrphus luniger (Mg.) (Diptera); adults common (P.S., R.C.).
S. balteatus (Deg.) (Diptera); adults abundant.
S. ribesii (L.) (Diptera); adults abundant.
S. glaucius (L.) (Diptera); adults common on umbels.
S. cinctellus (Zett.) (Diptera); adults common (R.C.).
Scaeva pyrastri (L.) (Diptera); adults common.
Melanostoma mellinum (L.) (Diptera); adults common.
Sphaerophoria scripta (L.) (Diptera); adults.
Chrysotoxum arcuatum (L.) (Diptera); adults sparingly (R.C., P.S.).
Eristalis tenax (L.) (Diptera); adults common.
E. pertinax (Scop.) (Diptera); adults common.
Helophilus pendulus (L.) (Diptera); adults common.
Varichaeta radicum (F.) (Diptera); adults sparingly (P.S.).
Calliphora vomitoria (L.) (Diptera); adults numerous (P.S.).
Acrophaga subalpina (Ringd.) (Diptera); adults sparingly (P.S.).
Morellia simplex (Lw.) (Diptera); adults abundant (P.S.).
Polietes lardarius (F.) (Diptera); adults abundant (P.S.).
Muscina assimilis (Fall.) (Diptera); adults abundant (P.S.).
Drymeia hamata (Fall.) (Diptera); adults abundant (P.S.).
Trichopticoides decolor (Fall.) (Diptera); adults common (P.S.).
Phaonia basalis (Zett.) (Diptera); adults numerous (P.S.).
P. halterata (Stein.) (Diptera); adults sparingly (P.S.).
Lophosceles cristatus (Zett.) (Diptera); adults common (P.S.).

Hebecnema affinis Malloch. (Diptera); adults abundant (P.S.).
Mydaea urbana (Mg.) (Diptera); adults abundant (P.S.).
M. tincta (Zett.) (Diptera); adults sparingly (P.S.).
Graphomyia maculata (Scop.) (Diptera); adults common (P.S.).
Limnophora maculosa (Mg.) (Diptera); one female (P.S.).
Hylemyia strigosa (F.) (Diptera); adults abundant (P.S.).
Tenthredo arcuata Forster (Hymenoptera); adults common.
Vespa rufa L. (Hymenoptera); adults common.

On tree trunks:
Anisopus punctatus (F.) (Diptera); adults sparingly (P.S.).
Rhagio lineola F. (Diptera); adults abundant (P.S.).
Helomyza v. hilaris Zett. (Diptera); adults sparingly (P.S.).
Alloeostylus diaphanus (Wd.) (Diptera) adults sparingly (P.S.).
Phaonia signata (Mg.) (Diptera); adults common (P.S.).
P. scutellaris (Fall.) (Diptera); adults common (P.S.).
P. gobertii (Mik.) (Diptera); adults common (P.S.).
P. errans (Mg.) (Diptera); adults abundant (P.S.).

On waterside vegetation:
Limnephilus affinis Curtis (Trichoptera); adults common (P.S.).
Anabolia nervosa (Curtis) (Trichoptera); adults common (P.S.).
Mystacides longicornis (L.) (Trichoptera); adults common (P.S.).
Mompha raschkiella (Zeller) (Lepidoptera); larval mines in Rosebay (P.S.).
Elachista cerusella (Hb.) (Lepidoptera); old mines in *Phalaris* (P.S.).
Anisosticta 19-punctata (L.) (Coleoptera); adults sparingly.
Wachtiella persicariae (L.) (Diptera); galls on *Polygonum amphibium* (P.S.).
Tetanocera laevifrons Lw. (Diptera); adults common (P.S.).
T. elata (F.) (Diptera); adults common (P.S.).
T. ferruginea Fall. (Diptera); adults common (P.S.).
**Liriomyza amoena* Mg. (Diptera); mines in *Sambucus nigra* (P.S.).
**Phytomyza angelicastri* Hg. (Diptera); mines in *Angelica* (P.S.).
Spaziphora hydromyzina (Fallen) (Diptera); adults common (P.S.).
Trichopalpus fraternus (Mg.) (Diptera); adults common (P.S.).
Cnemopogon apicalis (Wd.) (Diptera); adults common (P.S.).
Limnophora maculosa (Mg.) (Diptera); one female (P.S.).

On patches of exposed earth:
Agonum ruficorne (Gz.) (Coleoptera); adults common.
Bembidion lampros (Host.) (Coleoptera); adults on lane through wood (J.H.F.).
Pterostichus angustatus (Dufts) (Coleoptera); one adult in plantation (J.H.F.).
Scellus notatus (F.) (Diptera); adults sparingly on path by canal (P.S., L.N.K.).

In rotting fungi:
Quedius ochripennis (Menetries) (Coleoptera); adults sparingly (J.H.F.).
Lordithon lunulatus (L.) (Coleoptera); adults common (J.H.F.).

In dead trees:
Scolytus ?multistriatus F. (Coleoptera); old borings in elm (J.H.F., P.S.).
Trypodendron domesticum (L.) (Coleoptera); old borings in birch (P.S., J.H.F.).

Pleasure from Insects by **Michael Lehane.** Pp. 172 with 17 plates and many line drawings by Joyce Bee. David and Charles: Newton Abbot, 1968. 30/-.

Those naturalists, country-lovers and photographers who wish to find enjoyment in watching or photographing insects will find this an instructive and inspiring book. It gives a general account of a variety of insects, attractive butterflies, dragonflies, beetles, also spiders and other small invertebrates. The black and white plates, all but one from photographs by the author, are excellent indeed and even contrive to give to woodlice an esoteric beauty of their own. The many line drawings are both decorative and instructive.

Life histories and behaviour are described and the reader is told how to search for and find his quarry — and how to plant a garden to attract insects. This is not a book for entomologists. Photographers however, will find this a very useful guide to methods of photographing insects. The pleasure the author has found in insects is enthusiastically conveyed and this is a book to give to anyone with a developed bump of curiosity and a moderately good camera. J.H.F.

MARK MOWBRAY SAYER

(1895-1969)

Mark Sayer loved beautiful things, music, poetry, architecture, wild flowers. Whilst having a scientific, enquiring, mathematical mind — he represented Yorkshire at bridge before the last war — he also had a great love of the arts.

A native of Chelsea, he was educated at Rugby, his career in the Inland Revenue bringing him to Halifax in 1920. He was not content merely to enjoy the things he loved, but actively used his talents to encourage and organize those associations and institutions with which he allied himself.

Mark was Chairman of the Halifax Philharmonic Club, a past Chairman of the now defunct Halifax and District Association for the Encouragement of the Arts and held office as President and Treasurer of the former Halifax Literary and Philosophical Society. He was for many years keenly interested in church architecture, his interests turning to wild flowers shortly before the time he joined the Y.N.U. in 1947. From then onwards he and his wife were frequent attenders at Y.N.U. field meetings until serious illness incapacitated his wife. His botanical interests were not confined to British plants for he travelled widely on the Continent and was always on the look out for new plants. He became Treasurer of the Y.N.U. in 1956, continuing in office for twelve years; he was also keenly interested in conservation and an active supporter of the Yorkshire Naturalists' Trust.

Members of the Union will remember Mark Sayer as a good companion on many field excursions and as a Treasurer who maintained the Union's finances on a sound footing for many years.

ARTHUR C. COLLINGE

JENNIE GRAINGER

(1891–1969)

Jennie Grainger died at Greenacres, Meltham, on Ascension Day (15th May) in her 78th year and was buried in the churchyard of Helme, near the church school where she had served as headmistress for twenty-nine years until her retirement in April 1965. The mourners at the funeral service included old scholars and colleagues of Wilberlee School, Slaithwaite, and the Helme School, as well as fellow members of the Church Council of Wilshaw and Helme, and other friends and relatives, and representatives of the Yorkshire Naturalists' Union.

She joined the Y.N.U. in 1920, her early interests being in wild flowers and their ecology. She will be remembered by Y.N.U. mycologists as one of the happiest and most faithful of Honorary Secretaries. With unfailing interest, for a quarter of a century she had planned the details of the spring and autumn Fungus Forays, scouring the Yorkshire countryside in her little car, with her constant companion 'Mickey' on the back seat (which served day and night as his kennel), seeking suitable accommodation, a good workroom in particular. Indeed a more resourceful and reliable secretary it is hard to imagine, although she almost directly followed the famous A. E. Peck who, when he was made chairman of the mycological committee in 1931 handed over, with considerable reluctance, the minute books into which he had poured for twenty-seven years lengthy and vivid accounts of the meetings. (There had been a brief interregnum: John Grainger 1931-6 and George Sheard 1937-8). She gave her own service unstintingly. We were all so conscious of this that in her twenty-first year as secretary we presented her with a carved oak kist (a blanket box) made by a Yorkshire craftsman, together with a book of nearly a hundred signatures. The formal presentation was made at the Spring Foray of 1960 at Holme-upon-Spalding Moor among a good gathering of friends and with an excellent speech by Dr. Douglas Hincks. A few years later, in 1965, her long service to the Mycological Committee was fittingly recognised by appointment as its Chairman.

Meanwhile her lifework, the teaching of young folk, went steadily on. She had a special sympathy with and understanding of young minds and she sought to broaden their interests and to bring out the special gift of each one and to add a love of nature. Her school garden was famous and still continues. She loved beautiful things; handcraft especially appealed to her and she made herself proficient in different branches.

She will long be remembered for her wide sympathies, for her forbearance, her courage, her wisdom.

E. M. BLACKWELL

BOOK REVIEWS

Welsh Ferns, Clubmosses, Quillworts and Horsetails by **H. A. Hyde** and **A. E. Wade.** Fifth edition revised, expanded and rearranged by **S. G. Harrison.** Pp. xii + 178, with 14 plates and 85 figures. National Museum of Wales, Cardiff. 25/-.

First published in 1940, *Welsh Ferns* quickly established an enviable reputation. Successive editions have clearly shown that, like the Ford Motor Company, the policy of the management 'is one of continuous improvement'. The latest edition is particularly noteworthy for two reasons. Firstly, the original authorship has given way to the present Keeper of Botany in Cardiff. Secondly, the coverage has been widened to include *Lycopodium, Selaginella, Isoetes,* and *Equisetum.* These new sections of the book, which are most welcome, match the standard of the old. The rest of the text has been revised, not merely by the usual inevitable but depressing changes in nomenclature (e.g. *Dryopteris pseudo-mas* for *D. borreri*), but also by the addition of *Dryopteris assimilis* and the subspecies of *Asplenium trichomanes.* In all, Mr. Harrison deserves to be congratulated on his achievement in increasing the usefulness of this book while maintaining its high standard.

The title 'Welsh Ferns' has always been a little misleading. Although only Welsh species are illustrated, descriptions of *all* British species are given. In any case, there are not many British pteridophytes which are not found in Wales. This book remains the best available handbook for identification of British ferns. Let any prospective purchaser turn to pp. 85-7 and examine the admirable treatment of the two British species of *Hymenophyllum,* which is unrivalled as an aid for separation of these rather awkward plants. Now extended to cover all pteridophytes, and some fifty pages longer, the value of this book to the naturalist is correspondingly increased, and it is unreservedly recommended to all who want to be able to name these plants.

J.D.L.

The Naturalist on the River Amazons by **Henry Walter Bates.** Pp. xvi + 427. Everyman's Library No. 446. Dent. 16/-.

This welcome reissue of one of the great natural history classics appears in the new format of the Everyman series, with an introduction by Peter Fleming. Bates was one of the greatest traveller-naturalists and collectors. During eleven years spent in the Amazon valley he collected no less than 8,000 species — mostly insects — new to science. His zest for studying the habits of animals of all kinds, for collecting and for observing and recording accurately, information about the country through which he travelled and the people with whom he came in contact were proof against all the privations and hardships entailed by his hazardous journey.

The Naturalist on the River Amazons is a superb and unsurpassed account of tropical natural history, packed full of interest from cover to cover. The simple, direct and undramatised manner of the telling, in a prose 'as durable, as well-proportioned and as polished as a Victorian sideboard' make the impact of his narrative even greater in these days of streamlined expeditions with air-lifts, food drops, radio contact and elaborate medical precautions, than at the time of its first appearance over a century ago. How many travel books of today will continue to be reissued a hundred years hence? Every naturalist should read this book for it has a value which transcends the information which it contains though that alone should fire the imagination and act as a powerful stimulus to enthusiasm. W.A.S.

The Dolphin, Cousin to Man by **Robert Stenuit.** Pp. 176 with 29 illustrations in colour, 44 in black and white and 10 drawings in text. J. M. Dent & Sons Ltd., London, 1968. 40/-.

In Greek mythology dolphins had once been men and this is the attitude adopted by the author, who is really writing a book about his friends. Stenuit's enthusiasm illustrates the fascination these creatures have always possessed for people associated with the sea; it also disarms criticism of his distinctly fanciful palaeontology and his rather selective approach to the mass of interesting work done on dolphins and their allies in recent years. He brings out well the essentially amiable nature of these animals, their love of play and their astonishingly high degree of intelligence. The last has been a particular surprise since life in the very stable environment of the sea with, for mammals, much less competition than would be encountered on land, might make one expect a modest level of intelligence, as in manatees, but the truth is quite otherwise and there is now no doubt that the smaller toothed cetaceans at least are very intelligent indeed and perhaps, in their very different way, next to man himself. Apart from such special adaptations as their sonar system, of which he gives a good account, they have an elaborate 'language' for communicating amongst themselves which has led some workers, warmly supported by Stenuit, to hope that a basis of communication with ourselves can eventually be established. However one feels about this possibility, the experiments themselves make entertaining reading and the book is strongly recommended. T.K.

A Key to the British Fresh- and Brackish-water Gastropods by **T. T. Macan,** illustrated by the late R. Douglas Cooper. Scientific Publication No. 13 of the Freshwater Biological Association, Third Edition, 1969. 4/6d.

This is a reprint of a Key first published twenty years ago to serve students of freshwater biology. In this time there have been some changes in nomenclature which this edition now brings up to date. It has been found necessary to print the revised names at the bottom of the pages instead of alongside the line drawings and this may not be an advantage. Also it might have been reasonable to expand the section on Zonitoides and Succinea since these include waterside examples which may lead to some confusion if the key is used in isolation without supervision.

The Key will be found to be useful wherever freshwater biology is studied but a keen conchological student will rapidly outgrow it. E.D.

Précis de Lichénologie by **G. Trotet.** Pp. 194, with 45 line drawings, 41 photographs, 3 graphs and 1 map. Editions N. Boubée & Cie., Paris, 1968. 80/-.

The publication of a general text-book of lichenology is not an event which should pass unnoticed, especially when it has been produced as well as this one. This book is intended as a replacement to H. des Abbayes' *Traité de Lichénologie* which was published in 1951. The discussions of the morphology of lichens largely follow that adopted by des Abbayes except that '*Thalles stratifies-radies*' replaces '*Thalle composite*' as the name applied to the *Cladonia* type of habit. The choice of examples for the section '*Thalle fruticuleux*' is perhaps unfortunate, both examples having a pendant habit. The photograph (Fig. 14) labelled *Alectoria jubata* is not in fact of that species but probably of *A. fuscescens* Gyeln. A new term, *stereome*, is introduced to apply to the algal-containing layer in *Alectoria* and *Cladonia* between the medulla and the cortex.

Chemical tests are described well but the omission of references to micro-crystalline or chromatographic techniques is somewhat unfortunate. The section on the algae of lichens is extremely good and the differences between the lichenised *Trebouxia* and the non-lichenised *Chlorella* are stressed. The discussion on reproduction and the morphology of the ascus is well illustrated but the section on ecology is brief though helpful in that it discusses the nomenclature of lichen communities, something omitted in other recent texts on lichens. The sections on distribution and economics suffer from brevity and the distribution map of *Lecanora conizaeoides* in the British Isles is incomplete and to some extent misleading.

The collection and labelling of specimens is discussed and the author's plea for '. . . *Flores «d'amateur» modernes*' would be echoed by most botanists. A useful key to the families and genera of lichens is provided.

The chapters on physiology, symbiosis, synthesis of lichens, and the especial compounds of lichens are all somewhat outdated. Some discussion of the biochemistry and taxonomic application of lichen substances might have been helpful. It is unfortunate that the bibliography does not extend to 1967 to include the books of Hale and Ahmmadjian published in that year. On page 180 Paulson and Shibata are spelt incorrectly and there are several errors in the index. The omission of the *Bryologist* from the list of journals should be noted.

If this book is to be criticised it should largely be on the grounds of brevity. The numerous photographs and figures should recommend it to teachers at all levels.

D.L.H.

Excursion Flora of the British Isles

Second Edition

A. R. CLAPHAM, T. G. TUTIN and E. F. WARBURG

A concise and inexpensive Flora for the student and amateur botanist giving brief but accurate scientific descriptions of all the plants commonly found in the British Isles. The second edition includes two major changes: a completely revised treatment of the ferns and consequential changes in the key to families.

Comment on the first edition:

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Edited by
W. A. SLEDGE, Ph.D., B.Sc., The University, Leeds

with the assistance as referees in special departments of
R. F. Dickens
Ellen Hazelwood, F.L.S.
J. H. Flint, F.L.A., F.R.E.S.
E. W. Taylor, C.B.E., D.Sc., F.R.S.
H. C. Versey, D.Sc., LL.D., F.G.S.

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NATURAL HISTORY

SOME CHANGES IN BIRD-LIFE IN YORKSHIRE

R. F. DICKENS

The present paper is based on notes made for the joint Y.N.U.–Y.N.T. conference on 'The Changing Face of Yorkshire' at York University in September 1968.

In *British Birds* (1967–1968), John Parslow contributed a valuable series of papers on changes in status among breeding birds. These have proved most helpful. Unlike Parslow, I have not confined my comments solely to breeding species. In addition to his paper, I have consulted *The Birds of Yorkshire* (Nelson, 1907), *Yorkshire Birds* (Chislett, 1952), and annual reports of the Ornithological Section of the Y.N.U. (available only to the 1964 report at the time). Personal impressions as well as direct evidence are included in some instances as a basis for discussion. I hope that in sticking my neck out I shall evoke comment both on those species I have dealt with and those which I have omitted.

Many new species have been added to the county avifauna since 1952 and there have been a number of new breeding records, both regular and sporadic which should all be documented in due course. A number of migrant species have proved themselves to occur with much greater regularity than was formerly supposed. This is partly explained by more concentrated watching at places like Spurn, Teesmouth, Fairburn, etc.; partly it results from more regular habits in watching to meet the needs of B.T.O. enquiries, wildfowl counts and the like. There has also been a vast increase in the numbers of watchers and consequently of records. It is becoming increasingly obvious that to keep abreast of knowledge the 45 year gap which elapsed between Nelson and Chislett's publications is going to be too long for the successor to *Yorkshire Birds*. It is not intended however that this present paper should be considered as bringing *Yorkshire Birds* up-to-date. Implicit in its title is that I am dealing only with *some* changes. I feel that the ornithological section of the Y.N.U. should already be giving some thought to the possibility of a 20 or 25 year rather than a 45 year interval, with a major revision in 1972 or 1977. In the meantime useful surveys could well be made of a number of species. Some which have come immediately to mind I have indicated.

Reverting for one moment to the additions to the county avifauna, I must express disappointment that so many new species have been recorded without adequate reporting in *The Naturalist*. A bald statement in an annual report *may* suffice, for the record, and for the expert, but many of our general members will not appreciate the significance of Dusky Warbler, Petchora Pipit, Song Sparrow, Red-rumped Swallow, etc., and in consequence extreme rarities are on occasion reported as casually as if they were everyday occurrences. Besides setting the record straight more expansive accounts of some of these new species would help to broaden the knowledge of beginners.

DIVERS. In 1952, Chislett commented that there had been no recent equivalent of Nelson's 'at least 50 at sea, flying to S.E. in advance of an approaching storm'. The number of Red-throated Divers breeding in Shetland has shown an increase in recent years and the larger numbers of divers seen off our coast in winter are no doubt partly a reflection of this. Compared with Nelson's 50, we have 223 in eight minutes at Spurn, 330, up to 400, as just a few of recent figures. No doubt such figures are also accounted for partly by changing habits of observing.

GREAT-CRESTED GREBES suffered much from persecution last century. Their come-back has been assisted not only from more enlightened attitudes but also by the creation of man-made habitats. In 1931, H. B. Booth conducted a survey and found 65 pairs on 24 waters. Chislett found them fewer and blamed increased public access and industrialism. In 1946–49 he claimed 90 birds as against Booth's 130. In 1957 a figure of 50 pairs is given and in the following year the species occurred on 30 waters, with breeding on 24 (c.f. 1931) but numbers involved are not given. The 1964 Y.N.U. report provides details for only two out of the five vice-counties with a figure of 34 pairs on 18 waters. *It is clearly time for an all-out effort to carry out a complete census of this species within the county and for this to be written up fully.*

BLACK-NECKED GREBES nested in the county for the first time in 1928 and further nesting and attempts were recorded between 1943 and 1946. Two nests, with five and four eggs were abandoned subsequent to the drainage of Brotherton Ings in 1956.

There is little evidence on which to base a sound estimate of numbers of LITTLE GREBES or of population trends, but two things do come out clearly from more recent reports, (*a*) that the species suffers particularly badly in severe winters, and (*b*) that flocking occurs in late summer, with peaks quoted of 74, 93, 80 on some waters from early August to October. Nelson talks of immigrants in autumn but the dates suggest post-breeding flocking as a more likely explanation for the above high numbers of a species whose young are often reported as still being fed in mid-September and, in 1964, till mid-October.

In Nelson's time, the FULMAR was mainly 'off-shore as an autumn and winter visitor, seldom seen on the coast except as a result of stormy weather'. Fulmars first prospected the Bempton cliffs as recently as 1919 and Scarborough in 1921. The first breeding record for the county was in 1922 — only 46 years ago — yet it is now exceedingly common in suitable areas. There is a somewhat parallel story for GANNETS. In 1924 a pair was seen on Bempton cliffs and a nest was made the following year, though it was not until 1937 that it could be definitely claimed that eggs were laid. Only one or two pairs occurred each year until the late forties but eighteen sites were occupied by 1964 and it seems likely that numbers will increase in this only mainland breeding site in Britain and sole colony in England.

CORMORANTS and SHAGS would appear to have been subject to some confusion for a time in some areas. There were 24 occupied Cormorants' nests in 1964 on the north-east stretch of coast, but the species is less common than it was last century when a number of sites as far south as Flamborough were occupied, with a colony of 50 pairs at Scarborough. Shags formerly bred in considerable numbers at Flamborough but by 1907 Nelson wrote 'there is no evidence that it has done so except in isolated instances within the memory of living man'. Chislett (1952) says it occurs on the coast only occasionally but adds that 'one or two people have suspected that birds entering a hollow in the cliffs near Flamborough might be Shags not Cormorants'. Breeding was proved in 1952 and 1954 and doubtless occurs annually. The highest estimate available has been about 15 pairs. One wonders whether a crash in population may have occurred last century through similar causes to the recent one on the Farnes and again notes the parallel with the current increase in certain other sea-birds.

Both species occur occasionally inland and Shags especially seem subject to periodic 'wrecks'. I like the quote from the 1952 Y.N.U. report: 'a first-year bird walked into a workshop near the river at Wakefield — and died'.

HERON numbers have long been known to fluctuate according to the severity of the winters. After a bad set-back there has usually been a recovery within a few years. More recently however, there has been an alarming general decrease in the county of this very fine bird. Where 20 or 30 pairs occurred regularly at Hornsea in the past, only six were present in 1964; and Helaugh's 20 or more were down to eight. None were reported from Harewood or Whixley, each of which had a dozen or so earlier. This decrease has not been due entirely to the exceptional winter of 1962–63 as the trend had been noted earlier. Chislett gave tree-felling, anglers, and photographers as some of the causes, though the problem is probably much more complex. New colonies, founded when birds have been forced away from traditional sites, have not always been located with the thoroughness that was shown in the earlier Heron censuses. Unfortunately many of the present generation of bird-watchers devote their time so exclusively to rarity hunting that serious surveys get less than their needful share of attention. Credit is due to Trevor Gunton who has tried to remedy this as far as the Heron is concerned.

The BITTERN was fairly common as a breeding bird up to just over a century ago but became extinct throughout Britain by the mid-1800's. The species has re-established itself in a number of areas. As yet there appears to be no published record of breeding within the county but I think it is justifiable to hope that we shall again have it on the county list of breeding species within a few years.

Ducks — Swans

It is generally accepted that the TEAL has decreased but it still nests from high up in the Pennines to near sea-level. Nelson reported GARGANEY nesting in the East Riding in the 1880's. The first West Riding breeding occurred in 1926. From both Nelson and Chislett it is apparent that breeding reports were well spaced out in time and usually only one or two pairs were involved in any one year. Now, although numbers are still low, breeding is regular in several localities and those of us familiar with the species at, say, Fairburn tend to forget that there are probably not more than 100 pairs in Britain in any year. The man-made habitats of the West Riding seem to be to the species' liking.

GADWALL, described by Nelson as a winter visitor of rare occurrence, was becoming more common by 1952 and Chislett concluded that 'it is no longer confined to winter months and it will be no surprise if the species is proved to breed'. My own first acquaintance with Gadwall was in 1947, a year in which there were still only three records for the county. With the species still so uncommon then, I have often wondered whether the record which P. E. Davis and I submitted would have been accepted by Chislett but for the fact that M. F. Meiklejohn had seen the bird independently on the same water. Up to 1948, Chislett was listing every single sighting. To do so now would occupy far too much space, since Gadwalls are regular in many areas, generally in small numbers, and breeding occurs.

WIGEON are breeding regularly in the north of the county and SHOVELER is more widespread than in Nelson's day. Then, TUFTED DUCK was mainly a winter visitor though it nested in one or two localities. Now there are pairs on most waters during the breeding season. Nelson quotes a number of breeding records for POCHARD for last century. It has been regular and flourishing at Hornsea. From my own experience at Fairburn, where Pochard has been as common or commoner than Tufted, I found Parslow's summary ('a scarce breeding bird — about 200 pairs in England and Wales') rather surprising. If he is wrong, we in Yorkshire must take some of the blame. In not one of the Y.N.U. reports for 1961–64 inclusive is there any mention of breeding at Fairburn or Hornsea, the two strongholds of the species. The only reference in those four years is to a new breeding site in V.C. 62. How many of Parslow's 200 pairs could Yorkshire account for I wonder?

I had made notes under EIDER to the effect that there had been a general spread, that records for the county were now more regular and that it might well breed in the county in the foreseeable future. Checking in Nelson for the earlier situation I found that he made almost the same comments and a similar forecast — and that was in 1907!! It is interesting that in 1952, Chislett wrote that it would occasion him no surprise if GOOSANDER attempted to breed in Yorkshire in the fairly near future, but mentioned no such possibility for RED-BREASTED MERGANSER. Yet it is the latter which has bred since 1957 and there is, as far as I know, no published evidence that Goosander is yet a breeding species.

GREY-LAG GEESE used to breed in the county many years ago and the species has been re-introduced to a number of areas, possibly including some within the county. It will be as well to record any changes in the immediate future in detail and as far as possible to obtain W.A.G.B.I. advice about places, dates and number of introductions. Gadwall numbers *may* be attributable to a similar cause.

Of the two wild swans, WHOOPER SWAN is the more regular though the herds generally tend to be smaller than those for BEWICK'S SWAN. In 'good' years, Bewick's are more numerous than formerly and the largest herds quoted by Chislett (39, 27, 26, 49) are put into the shade almost every winter.

Birds of Prey

BUZZARDS used to breed in Bishopwood, Selby, in Wharfedale, Swaledale, Wensleydale, near Masham, etc., but by Nelson's day had become 'exceedingly rare, having gradually become scarce since the gun came into general use'. Buzzards still nest in small numbers in the north-west of the county where PEREGRINE also still maintains a precarious foothold. I have said before, and I repeat now, how much I deprecate organised club outings to see these vulnerable species in the breeding season.

MARSH, HEN and MONTAGU'S HARRIERS all bred in the county last century. Montagu's was the 'last to leave' and has again bred sporadically especially since the mid-1930's. Hen Harrier has recolonised many areas outside the county and we may well be able to claim it once again as a breeding species soon. The same can be said for these two species as Chislett said of Marsh Harrier — 'If a pair should attempt to breed one year it is to be hoped that they will be allowed to breed in peace, free from the disturbance they so much dislike and may resent to the point of desertion'.

The Sparrow-Hawk is now probably not much less uncommon than the Buzzard and Merlins also are apparently less numerous than in earlier years. Happily, more recent (verbal) reports indicate some improvement in the position of both, as also a recovery of Kestrel numbers.

Waders

As a breeding species, the Oystercatcher used to be confined in Yorkshire to one or two pairs at Spurn. From 1936 onwards, it has bred inland in the Dales to which it has apparently spread from the west coast. This is a species for which an up-to-date breeding survey is needed and which should not be too difficult to carry out. By contrast, nesting Lapwings appear to have decreased, especially since the 1962–63 winter, from which there has been only a slow and partial recovery. Although we now seem to have fewer breeding pairs, my own impression is that we now have more than ever Lapwings during the winter months.

Ringed Plovers breed on the coast much less commonly than they used to do, mainly because of the ubiquitous motor-car I suspect. There have been some instances of inland breeding but the Ringed Plover has not exploited these areas to the extent that Oystercatchers have.

It is only 20 years since the Little Ringed Plover was first proved to breed in Yorkshire, though it had been suspected of doing so the previous year (1947). Chislett refrained from mentioning any locality for the species, though it is now safe to record that the first instance was at Swillington. There are now something like 30–40 pairs spread over a wide area of the county and in a variety of habitats. In the complex of flashes with nearby colliery spoil-heaps (so favoured by the bird in our county) it would surprise me if a good many pairs are not overlooked. Only this year (1968) I found no fewer than six pairs in an area where they had not been recorded before.

The most recently published annual reports all seem to be pre-occupied with the build-up of winter flocks of Golden Plovers to the almost total exclusion of information regarding the breeding status. Fewer ornithologists appear to make a point of walking on the moors these days. If they did, I suspect that they would find Golden Plovers much less common than they used to be. This certainly applies to the one area I know well. Fewer breeding records for Dunlin are forthcoming, possibly for the same reason. From being a bird mainly of the high moorland areas, the Curlew has now spread well out on to the lowlands to breed; and some flocks stay inland during the winter months.

The position with regard to passage waders is difficult to interpret in most cases because of annual fluctuations, the variability of suitably attractive feeding areas, and the difficulty of assessing the effects of increased watching. It would seem that some waders, notably Greenshank and Green Sandpiper, may be staying on more regularly through the winter. Ruffs may also fall into the same category. The species formerly bred in the county; it has returned to some former haunts elsewhere and more are now being recorded in Yorkshire.

Gulls — Terns

The gulls generally have increased tremendously. A few pairs of both Great Black-Backed and Herring Gulls now nest inland in the north west of the county. The latter are much more numerous on the east coast where, strangely, the Lesser Black-Backed Gull is scarce. They have increased inland however, breeding at Stocks Reservoir and in large numbers in Roeburndale where part of the colony is on the Yorkshire side of the boundary. Many more Lessers also remain with us throughout the winters now.

The Common Gull has nested and Black-Headed Gulls have again increased in the past 50–60 years. In 1881, it is said, there was only one station for this species in Yorkshire, though earlier than that there had been large numbers breeding in the lowland parts of eastern Yorkshire. Drainage dispersed most of these earlier colonies (Skipwith is a notable exception) and the build-up this century has resulted from the colonisation of the moorland areas. Surveys of Black-headed Gulls were carried out in 1920 and 1938 and detailed information is available for the locations, sizes and dates of various colonies. There have obviously been changes in the thirty years which have elapsed since the last survey and the time is ripe for the present situation in the county to be detailed once again.

KITTIWAKES were much persecuted on the Bempton cliffs, etc., until the Sea-birds Preservation Act of 1869. The species has increased and colonised new areas this century, e.g. Castle cliff, Scarborough.

It is a matter for regret that we are now virtually without any breeding terns. Occasional reports are given of COMMON TERNS nesting, sometimes inland; and the ARCTIC TERN is said to have bred on occasion. But neither do so regularly. LITTLE TERNS were once the pride of Spurn, of course, but have almost ceased to grace the area. It seems certain that BLACK TERN nested at Fairburn on one occasion in recent times, but unfortunately the sought-for confirmation was not provided.

There has probably not been much over-all long-term change in the status of the owls, though my own impression is that LITTLE OWLS have recently become scarcer. The species didn't really establish itself in Yorkshire until after 1911.

There is little doubt that WOOD PIGEONS have increased. The availability of arable feeding areas in fairly close proximity to the admirable roosting and nesting areas provided in plenty by the Forestry Commission have favoured this species. TURTLE DOVES have gradually extended their range in the county and, of course, COLLARED DOVES, which were totally unknown ten years ago are now not only numerous but widely distributed. The STOCK DOVE is not at all well documented in recent reports and in view of suggestions of a decline elsewhere, I feel we should attempt to establish what its present status in the county is.

Parslow speaks of an increase in GREEN WOODPECKERS, but I feel certain that the recent history of the species in Yorkshire is one of a sharp decline. It received a hard knock from the 1962–63 winter from which it still does not appear to have recovered and is still entirely absent from some of its haunts of 10 years ago.

The RAVEN is still scarce, clinging only precariously to one or two sites in the north west. I would suspect that ROOKS have become fewer, and the same is possibly true also of MAGPIE, though the latter has taken much more to breeding in suburban areas and may in consequence give the impression of being commoner. The MISTLE THRUSH is similar in this respect.

Passerines

When we come to the passerine birds it is generally much more difficult to detect long-term trends. Many of them seem to be subject to periodic fluctuations, with cycles of varying duration between low and peak numbers, quite independent of the effects of severe winters which do, of course, affect many of the non-migratory passerines. Some of those which do migrate may be fewer than usual because of adverse conditions met on their journey in any one year. Many of the passerines are so widespread — though not necessarily abundant — throughout the county that only the most general of comments can be made about them in annual reports and consequently changes in status are not immediately apparent. By providing the necessary yardsticks, some of the more general census surveys organised by the B.T.O. will in some measure help to remedy this for the future. For the above reasons, among others, I propose to mention only a few of the passerines.

It has been stated that there has been a big decline in the numbers of WHEATEARS south of us, but I do not recall any comment to the effect that the species has so far decreased in Yorkshire. In view of the changes further south, it would be a useful exercise for one of the local societies, suitably placed, to establish present distribution and numbers within their area so that any future alteration can be measured. There can be no doubt at all that the STONECHAT has been nothing more than a very casual breeder this century and its apparent increased regularity of late is most welcome. I must confess to a measure of doubt about some of the records of Stonechat nests from about fifteen years ago.

A species which has not received much comment but which in my experience is less common than 15 years ago is the SPOTTED FLYCATCHER. I have heard quite a few people, however, express the opinion that WOOD WARBLERS are fewer, and myself know several areas from which the species has disappeared. This would be a good subject for study within the county, or even within a more limited area. The most dramatic decrease, in my estimation, has been in the status of the CHAFFINCH — 'one of the commonest — perhaps the most numerous of all birds in the county' only 15–20 years ago. The species is still abundant in many areas, but it is not the ubiquitous bird it used to be. Areas in Bucks. which I knew well as a boy and in which

Chaffinches were then abundant, have similarly lost their large numbers and are reduced to odd pairs.

I recall writing to our then recorder for V.C. 63 from that same part of Bucks. several winters ago to the effect that BULLFINCHES were everywhere, being about the commonest bird I had seen on a particular walk. They are now back to a normal level and I suspect that the Bullfinch may be subject to some cyclic variation. The species was said to be coming more common in Yorkshire a few years back. Has the trend continued, I wonder?

The GREENFINCH appears to me to be the outstanding example of a species which has increased over recent years. Perhaps this is an impression engendered by Greenfinches acquiring the habit of visiting suburban gardens and feeding, tit-like, on peanuts. The vast increase in the numbers of people providing food for birds in winter must surely have resulted in better survival and increased numbers of those species which come readily to the bird-table. Along with Greenfinches I think that LINNETS and REDPOLLS have become more numerous and possibly also GOLDFINCHES. That they have done so, if indeed they have, may be partly due to the fact that fewer birds are now caught and caged. The TREE-SPARROW seems to have increased even within the past ten years. DUNNOCK or Hedge Sparrows must surely be about the most frequently seen but least often recognised birds where the general public are concerned, since unobtrusive pairs visit almost every garden. The species is equally common in woodland, along hedgerows and in city parks.

Look — a selection from the BBC-TV natural history series, edited by **Jeffery Roswall.** BBC Publications. 30/–

Warne's Natural History Atlas of Great Britain by **Arnold Darlington.** Frederick Warne and Co. Ltd. 35/–

Field Natural History by **Alfred Leutscher.** G. Bell and Sons Ltd. 60/–

In considering these works together one can link them by the fact that they are all manifestations of current trends in natural history interest. The *Look* series was probably the greatest populariser of wildlife to originate on British television and here is a chance to see again some of its successes. Each chapter covers a different episode, with text by the person responsible for its TV presentation, and all are well illustrated.

Arnold Darlington's *Atlas* will no doubt be appreciated as a companion on country or coast orientated outings, but in fact the maps, with a geological and/or vegetational bias, are sketchy and confined to 14 pages. The preceding 73 pages are illustrated essays on various types of countryside. The illustrations are, in my opinion, too variable to be really useful in a field sense.

The ecological work of Alfred Leutscher is likely to be of service to anyone needing an introduction to the subject and the field work section is commended to teachers and tutors, etc. who may have to set up ecological experiments and surveys. One can easily imagine a natural history novice receiving each of these books in turn and progressing beyond the range of all three in a short time: if this happens all three works will have achieved something. T.M.C.

Seals by **K. M. Backhouse.** Pp. 96 with 16 colour and 60 black and white photographs. Arthur Barker. 21/–.

Giraffes by **C. A. W. Guggisberg.** Pp. 96 with 16 colour and 60 black and white photographs. Arthur Barker. 21/–.

These are two works in the *World of Animals* series and are thus worth considering together. *Seals*, after briefly considering the world range of the group, dwells mainly on the two British species. The Grey Seal has been the subject of much of Dr. Backhouse's recent research and receives the greatest attention.

Mr. Guggisberg has the advantage in that most of his book is devoted to a single species, with just one chapter dealing with the Okapi, and this gives a better coverage of its subject that the previous one. Both works are very well illustrated and can be recommended, particularly if the reader intends to buy all the works planned for the series. T.M.C.

SOME OBSERVATIONS ON COPULATION AND ASSOCIATED BEHAVIOUR, AND FOOD SEARCHING OF THE LITTLE OWL

J. B. AND A. E. HAGUE

The observations detailed here were made in 1965 on a pair of Little Owls (*Athena noctua*) which had formed territorial claim about a hollow elm tree, which was one of many forming an avenue on a road running between arable fields, from Cadeby village to Sprotborough village in South Yorkshire.

The tree, which had provided a nest site for the same, or another pair of Little Owls in previous years, consisted of a trunk broken off some fifteen feet from the ground with one large diameter branch broken off a short distance from the trunk. From the top to the junction with this branch, the tree was hollow, as was the branch.

Observations were made on nine occasions, mostly from a car parked within ten yards of the tree. The car was moved closer to the birds when possible, when activity was more distant. Copulation and associated behaviour were observed on three occasions and notes were made on the spot by dictation, as two observers were present. These notes constitute the data set out in this paper, with the addition of notes taken on food searching.

On 30th March at 1900 hours the horn of a passing car disturbed a male Little Owl which flew from the top of the hollow elm tree and alighted on an almost horizontal branch on the next tree. A female appeared and flew to the same tree alighting on a higher branch. The male watched passing traffic and shuffled, fluffed out his feathers and periodically turned his head to one side. She, facing in the opposite direction was also periodically turning her head. She walked along her branch to the trunk of the tree and climbed up it a short distance, in a manner similar to that of a Tree Creeper (*Certhia familiaris*), then returned to her original position. She bobbed her head and several times stretched herself up making her body tall and thin. She flew to a lower branch and settled near the trunk of the tree in a position above the perch of the male. Her head was held forward as if looking hard at the nearby hollow elm tree. He remained hunched with feathers fluffed out, facing in the same direction as she. She then returned to her first perch and looked away for a long period before turning about and looking occasionally at the car. He flew up and alighted beside her remaining for some minutes looking about in all directions. Both birds were preening scapulars and scratching facial discs with their talons. Without any detectable signal she turned horizontally along the branch facing away from the trunk. Immediately the male mounted her back. She crouched slightly and swivelled her tail to one side as he performed a treading action accompanied by wing flapping. His tail was held straight out. During coition, which lasted almost fifteen seconds, a typical unhurried Little Owl "kiew" call was emitted by the male. The female remained silent. Coition was terminated by the male jumping on to the branch ahead of the female, from whence he flew directly away. She returned to the normal cross-branch position fluffing out per feathers. She remained thus for almost five minutes, then stretched up making herself tall and thin several times before flying away in the opposite direction to that taken by the male.

On 2nd April at 1940 hours the male Little Owl was observed perched on a tree stump in a field hedge which was at right angles to the road and thirty yards from the hollow elm tree. He flew to a sappling in the opposite parallel hedge about one hundred and twenty yards from the hollow elm tree. The female appeared, flying low over the ground from a distant part of the field. She alighted on a block of limestone eight yards from the perch of the male. After a short pause she flew to a sappling in the same row as, and fifty yards from, the hollow elm tree. She moved to the next sapling, then into the lower branches of the next elm tree to the hollow one, i.e. the "coition tree" of 30th March. After a short pause she flew to a stump in the hedge where the male had first been observed. He flew from his perch momentarily alighting on the ground in the centre of the field, then flew to another stump just ahead of the female. She flew and alighted on the ground at the foot of an elm tree in the same hedge and was quickly joined by the male. They faced each other and appeared to touch bills, this could have been a food pass. Immediately, he flew to the centre of the field and alighted and she flew up into an elm tree which was about fifty yards from the hollow elm tree. She was joined by the male who flew to a higher branch. She then flew up and alighted on the same branch as him but a little below. She walked up the branch towards him with a wing fluttering soliciting action. He mounted, standing on her head and facing her tail, but quickly changed to the normal position adopted during coition. She was standing in a horizontal position along the branch, facing away from the trunk. During coition the male stopped his treading action and rested, then began again with a gentle wing flapping. Coition lasted approximately ten seconds, during which time a constant "kiew vi kiew" call was heard, but it was not possible to determine which bird was calling. Coition was terminated by the action of the female flying from under the male and alighting on a lower branch, but the calling continued. She turned and looked up at the male, then flew up to and around him and back to her perch, twice. He then flew down and mounted her and coition took place for approximately twenty seconds. The female was perched aross the branch during coition. During this period he rested six times, remaining on her back. Coition was terminated when they each moved to separate branches. She preened and then flew up to the next branch, he followed and as she turned along the branch he mounted her again. Coition lasted about five seconds before he alighted beside her. The "kiew" call was repeated and he again mounted and coition lasted for two or three seconds. Immediately afterwards she flew away passing close by the hollow elm tree. The male was not observed leaving.

On 7th April at 1940 hours the male Little Owl was observed in an elm tree forty yards from the hollow tree. He flew across the road into the top branches of another tree. After pausing, he flew to the next tree and then to the next, which was almost opposite the hollow elm tree, some nine yards away. He was joined almost immediately by the female who appeared from behind the hollow tree. She performed a neck-stretching display three times whilst looking directly down at the car, then jumped over the male and flew to a slightly higher branch. He flew up to a branch of equal height about three yards from her. Both birds began preening. He then flew and alighted beside the female giving a single "kiew" call. She continued to preen and he also began to preen. She moved a short distance away from him along the branch but he immediately moved up alongside her and mounted her with his wings gently flapping, she sitting across the branch. Coition lasted almost twelve seconds. The male repeatedly gave a call which can be described as "tchoock tchook tchook tcheroo". The female gave a high-pitched call of "scee scee squeee", not unlike that of a juvenile House Sparrow (*Passer domesticus*), soliciting food. On termination of coition the male flew directly to another elm tree, then away out of sight. After a short pause the female flew away in a direction almost opposite to that of the male.

Later in the year nestling Little Owls were observed in the hollow elm tree and were accepted as proof of successful breeding.

FOOD SEARCHING BEHAVIOUR

On 30th March at about 20.00 hours, a Little Owl was observed on the ground about five yards from a hedge in a newly-set field. A second Little Owl flew low over the hedge and alighted some yards ahead of the first owl, which appeared to be searching the ground as it walked forward between occasional halts. The second owl then flew back over the first, turning almost at the hedge, then flying a reciprocal course, alighted on almost the same spot. Both owls then continued slowly walking forward, giving the impression of searching, but were not observed to take food. Observations were made difficult by failing light.

On 1st April at 20.05 hours a Little Owl was observed to leave a perch and swoop into a newly-set field, where it alighted on the ground and began walking slowly forward apparently searching for food. A second owl flew out of the dusk and passed low over the first owl, alighting at just the limit of vision. The first owl immediately flew low over the ground and over the head of the second owl and was lost to sight. The field was a different one from that of 30th April.

On 6th April at 20.10 hours a Little Owl was observed on the ground in a newly-set field. It was walking forward apparently searching the ground and occasionally moving some distance with its wings raised and flapping as if to assist in more rapid movement in pursuit of moving prey.

On 12th May an adult Little Owl was observed leaving the hollow elm tree. It alighted on the ground amongst a growing crop. The bird was observed progressing across the ground in a series of hops and short flights punctuated by periods of rest in an apparent search for food. A second owl flew low over the first owl and alighted in the next field. The first owl immediately followed the second, both eventually moving out of sight.

MAMMALS OF GIBRALTAR POINT NATURE RESERVE, LINCOLNSHIRE, 1966–68

T. M. CLEGG
City Museums and Art Gallery, Dundee

During the period 1966–68 I collected small mammals and made observations on the Gibraltar Point sand dune system, as part of a wider study on the small mammal faunas of sand dunes and similar habitats. These notes cover certain aspects of this work and also form a check-list of the mammals encountered, though not necessarily collected, during this period. A number of earlier records are included to complete certain sections of the faunal list. Conditions at Gibraltar Point offer interesting comparisons to those which occur on the Spurn Peninsula, some 45 miles to the north, but the structure of Gibraltar Point is so different from the point of view of mammal colonisation that a brief account of the terrain is given here.

Study Area and Methods of Investigation

The Field Research Station at Gibraltar Point lies about four miles south of Skegness on the northern tip of the Wash. The reserve consists of two lines of dunes, approximately half a mile apart at their southern extremities, but converging at their northern ends, with marshland occupying the area between them. The dunes are thickly covered with Sea Buckthorn, Elder, etc. towards their northern ends and dense cover of this type covers the area where they converge. The dune lines consist of an old (western) and new (eastern) set of dunes, the former representing the shore line of about 200 years ago, the latter being about 80 years old and still developing eastwards. The marsh, which extends from the Buckthorn – Elder scrub to the shore of the Wash, is freshwater at the northern end but becomes progressively saltier as it extends southwards. The buildings explored consist of the Research Station, now mammal-pest free, and the Bird Observatory buildings on the eastern dunes near the Wash shore. A road backed by arable land forms a large part of the western boundary of the reserve, as does the tidal creek of the River Steeping. Between the creek and the road there is an abandoned farm with a well timbered but overgrown garden area. At least half of the reserve boundary lies along a land border, and this is one of the major differences between this reserve and Spurn, where the colonisation corridor is comparatively narrow.

On each visit thirty to fifty breakback traps were used, and the setting of these was to the following general pattern. Traps were laid in sets of three, with a distance of about three feet between each trap, and in each area under investigation five sets of traps were normally used with a distance of about thirty feet between each set. Naturally, this arrangement depended upon the terrain, and in the less vegetated areas or the public car park, smaller numbers of traps were set at points where results were considered likely. All traps were baited with cheese and were covered with grass where mammal runs were not available. The total catch was low in proportion to the number of trap/nights, but this was expected in view of the pattern of trap setting.

In addition to the animals trapped, a certain number were found dead, killed as pests, or occurred as skeletal material in owl pellets. Short-eared Owls (*Asio flammeus*) were frequently seen and their pellets, as well as sight records of the preys taken by them, contributed to the data collected. The numbers of small mammals prepared for study purposes as skins was as follows: *Sorex araneus* 51, *Sorex minutus* 29, *Neomys fodiens* 1 (earlier record), *Clethrionomys glareolus* 6, *Microtus agrestis* 2, *Apodemus sylvaticus* 24, *Mus musculus* 5 (anti-pest campaigns). Apart from those whose sources are indicated, the rest were caught during the investigation as described above.

The following list summarises the mammal species encountered at Gibraltar Point and includes some data on species which were not collected as detailed above.

Systematic List

Insectivora

Hedgehog (*Erinaceus europaeus*). Fairly common, particularly in the well vegetated parts of the West Dunes.

Mole (*Talpa europaea*). Widespread, wherever suitable soil for burrowing occurred. The rabbit-proof plantation near the abandoned farm and the thickly vegetated western dunes appeared to be favoured areas.

Common Shrew (*Sorex araneus*). The most frequently trapped species. Found in all habitat conditions including the slightly raised banks of the marsh, which was subject to periodic flooding. Adults of this species in summer pelage were conspicuously tri-coloured, closely matching specimens from Spurn Point in East Yorkshire, Cley in Norfolk and other coastal localities.

Pigmy Shrew (*Sorex minutus*). Present in all habitat conditions, with a tendency to be more common on the more sparsely vegetated East Dunes and on the maritime grassland around the Field Station. On the sample trapped, 29 *S. minutus* in a total of 80 Sorex species, the percentage of minutus in the population would be about 36%. This is very close to the 35% mentioned by Southern (1964) as recorded from dunes in Germany. During the Gibraltar Point study, analysis of mammal remains from discarded bottles in the dunes and comparison of these with trapping results indicated a similar level of abundance for minutus. In this note (Clegg, 1966), I gave details of the traps used and these and subsequent results strengthened my view that careful setting can eradicate any bias against the trapping of lightweight animals.

Water Shrew (*Neomys fodiens*). The only record is of an adult found dead, in September 1964, on the sandy spit which projects southwards from the East Dunes into the Wash. This shrew which was freshly dead when found, was prepared as a study skin by Mr. C. J. Devlin and deposited in the collection of Doncaster Museum.

CHIROPTERA

No bats were caught during the period under review, although small numbers were seen around the Field Centre, particularly during the period 10th–15th September 1967. From observations it appeared likely that two species were present, probable Pipistrelles and possibly one of the small Myotis species.

LAGOMORPHA

Rabbit (*Oryctolagus cuniculus*). Widespread and often abundant. Sandy and black mutants were frequent and white-marked individuals not uncommon.

Brown Hare (*Lepus europaeus*). Fairly common, particularly on the arable land to the west of the reserve.

RODENTIA

Bank Vole (*Clethrionomys glareolus*). Of those trapped, all were on the West Dunes apart from one from the East Dunes. It would appear likely that these results might be a true reflection of the species' distribution and that the more densely vegetated West Dunes were favoured to a greater extent. The apparent scarcity of this species at Gibraltar Point was in contrast to its status at Spurn, where it was common in similar habitat conditions (Clegg, 1965).

Short-tailed Vole (*Microtus agrestis*). Only two were trapped, in the raised banks of the River Steeping. However, the species was apparently common in the marsh section, judging by the consistently successful hunting of Short-eared Owls there, and by the number found dead in September 1967 following one of the periodic incursions of the sea during the high spring tides.

Water Vole (*Arvicola terrestris*). Restricted to the northern, freshwater section of the central marsh, where it did not appear to be numerous.

Wood Mouse (*Apodemus sylvaticus*). Found in all but the marshier sections of the area. Abundant on the East Dunes, where burrows were found on the seaward slope which supported the scantiest of vegetation. The Bird Observatory and associated buildings had a high population at times.

Yellow-necked Mouse (*Apodemus flavicollis*). This species was not encountered during the period of my investigation, though Mr. A. Lodge, the reserve warden, and others, stated that it had formerly occurred. Specimens appear to have been taken in the Field Centre, on the west side of the reserve and in the Bird Observatory, on the eastern dunes, but none were preserved.

House Mouse (*Mus musculus*). Specimens were received from the Field Centre during the early stages of the project, but this population later succumbed to the general increase in hygiene and had not recolonised the area by 1968. None were found out of doors, but the species had been present in the abandoned farmstead some years previously.

Brown Rat (*Rattus norvegicus*). Only encountered casually, on the road along the western side of the reserve.

CARNIVORA

Fox (*Vulpes vulpes*). Frequently seen and apparently quite common. Whilst their predation of Rabbits was regarded as beneficial, some losses of young in the Little Tern (*Sterna albifrons*) colony were ascribed to this species.

Stoat (*Mustela erminea*). Seen occasionally, but my impression was of a low level of population over the whole area.

Weasel (*Mustela nivalis*). Apparently relatively scarce. Another contrast between Gibraltar Point and the Spurn Peninsula was the comparitive infrequency of mustelid sightings. Whilst this may reflect the difference between a larger, more vegetated area, and a narrow peninsula, it is possible that they may have been generally less common.

Common Seal (*Phoca vitulina*). Fairly numerous on all visits, with over 60 at times on offshore sand banks. This area is a well-known breeding ground of the species.

SUMMARY

This paper summarises the mammal species recorded on the Gibraltar Point Nature Reserve, Skegness, Lincolnshire, during the period 1966–68. Visits were made to the area at the following times: 12th–16th March 1966, 8th–12th May 1966, 9th–12th April 1967 and 10th–15th January 1967 and specimens were received from correspondents in the area up to June 1968. The mammal specimens collected were used as comparative material in wider studies on sand dune mammal faunas. Comparisons are made between Gibraltar Point and the Spurn Peninsula in Yorkshire, some 45 miles to the north.

ACKNOWLEDGEMENTS

During most of this period I was in receipt of a Leverhulme Research Grant, for which grateful acknowledgement is made to the Trustees. On all visits to Gibraltar Point and over the whole period, I received assistance from Mr. A. Lodge and Mr. R. B. Wilkinson. The Lincolnshire Trust for Nature Conservation, and Mr. A. E. Smith in particular, offered every facility during the period. My wife, as usual, assisted with the preparation of mammal skins.

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THE SAND LIZARD IN NORTHWEST BRITAIN

C. SIMMS

INTRODUCTION AND ACKNOWLEDGMENTS

This paper attempts to describe the known distribution and establish the present status of the Sand Lizard *Lacerta agilis* L. in northwestern Britain, based on review of the literature and investigation in the field between 1962 and 1968. Only the more important sources are indicated in the list of references and not all correspondents and others who have helped in the fieldwork from 1962 to 1968 can be individually acknowledged here. The author is grateful to the many naturalists who have contributed verbal or written reports, field-sketches, photographs and specimens. These items and detailed comment which cannot be included here, will be deposited at the Yorkshire Museum, York, or some other institution where their preservation can be assured, when the author himself moves on; until then they are available on application. Preserved specimens, which with data are the most valuable records of all, are already incorporated into the collections at the Yorkshire Museum, except where otherwise stated.

The work was guided by R. Wagstaffe of Liverpool Museums. J. Baker, R. Beel, A. Brown, D. Proctor J. and W. R. Skeels helped with fieldwork. Without exception, the secretaries of the southwest Lancashire chain of "links" golf clubs granted permission to visit their properties, whilst the North Wales and North of England regional officers of the Nature Conservancy (Natural Environment Research Council) also supplied permits to visit and search reserves in their care. Miss A. G. C. Grandison and R. J. Knowles helped at the British Museum (Natural History); other museum help came especially from Mrs. C. Clarke (*née* Bracegirdle) and Dr. L. S. Garrad at Douglas, Mrs. H. Wood (*née* Forsyth) at Chester, and Mr. J. R. Rimmer at Warrington.

For the purposes of this account "reports" mean unpublished and "records" published references to "Sand Lizards", "sand-lizards", "*Lacerta agilis*", or these synonyms of this species known to have been used in the British literature:

1758 *Lacerta agilis* Linnaeus, partim. Syst. Nat., Ed. 10, 203.
1768 *Seps caerulescens* Laurentus, Synops. Rept.: Fig. 3.
1802 *Lacerta stirpium* Daudin, Hist. nat. Rept.: 3, 155 (*L. sterpium* auct.).
1804 *Lacerta anguiformis* Sheppard, Trans. linn. Soc., London, 71, 51.

There has been much confusion, in the field and in the literature, over the diagnostic characters of the Sand Lizard; a situation which is reflected in the fact that there are at present at least two major provincial museums showing specimens of the Viviparous or Common Lizard *Lacerta vivipara* Jacquin labelled 'Sand Lizard'. There can be little wonder that many naturalists, including some with a great deal of experience of vertebrates, have repeatedly made mistakes. When features diagnostic for specimens in the hand are not agreed by various authorities in the available literature how can so-called "field characters" be expected to be reliable? So often our reptiles give only a fleeting glimpse, and so it is hardly surprising that so few amateur or professional zoologists in this country are sufficiently familiar with them to name them at a glance with any confidence. Our unfamiliarity with them works against their conservation. The informed public at large, and the nature conservation bodies in particular, are not aware of the increasingly critical status of some of our few species of herpetofauna and of the Sand Lizard in particular. The species is known to occur in only a very few dune and lowland heath localities; and all of these are habitats threatened with destruction today.

The satisfactory determination of the species of Lacertid lizards is, even in this country, not straightforward. There are introductions, attempted introductions, escapes and hoaxes involving several continental species; and so the whole genus must be considered when a given lizard is examined. The best, comprehensive key to *Lacerta* is that of Mertens and Wermuth (1960); a partly-plagiarised and simplified version in English is in the press and it is not proposed to repeat it or reduce it here. The accurate naming of lizards depends, not on habitat or on coloration or on markings, but on structure and particularly on details of scale pattern. Only examined, preserved or living specimens from trusted sources support the records accepted here; nearly all these have been seen by the author. The presence or absence of lizards in a given area is not difficult to establish if there are opportunities for repeated visits in the most favourable months — usually May and September. Finding lizards is one thing, watching or catching them to discover which species are represented is another.

SOUTHWEST SCOTLAND

Leighton (1903, 57) mentions a report from Ayrshire which he did not accept. No reports have come to the author's notice.

NORTHWEST ENGLAND

Coward (1901) reviewed the known status of the species in the North of England in a masterly paper which first brought Northern populations of the Sand Lizard to general notice.

CUMBERLAND

No reports have reached the author, and none were known to Coward, Leighton, or Taylor (1963). On South Solwayside, the Drigg Peninsula, and elsewhere there is terrain similar to that used by the species elsewhere in Britain; and the present author has worked those localities rather little. R. F. Mash (*in litt.*, 1962) had not seen or heard of Sand Lizards on the Drigg Peninsula.

WESTMORLAND

No reports are known to the author.

LANCASHIRE

There are two districts with suitable terrain, each with records. These are dunes and dune heath; at Walney Island and neighbouring localities in the north, and between Southport and Liverpool (Crosby) in the south. Possible former occurrence in the north rests on the authority of Johnstone (1906); no specimens are known. The present author has seen only *L. vivipara* there. Further unconfirmed reports from near Lytham early in 1965 (J. Baker, *pers. comm.*) were satisfactorily referred to *L. vivipara* when the author visited him.

In the south the coastal system of sand dunes, up to two-and-a-half miles wide, still constitutes the best-known Northern station for the species. Verifiable records go back to about 1856, and perhaps earlier. Destruction of the habitat has restricted the species to several rather insecure stations near Southport and Formby, some of them within built-up areas. The total dune population was estimated in 1964 at some 400 individuals (Simms, 1966). Inland there are other sandy localities in South Lancashire and R. Beel caught one of two Sand Lizards seen in 1962 on mossland at Simonswood, now being built over. Subsequent search by the author revealed another in 1966, and this was a juvenile individual indicating successful breeding in that year.

The isolation of some of the Lancashire stations from one another, and some of this must be upwards of a hundred year's antiquity, argues against the recent introduction of the species into Lancashire.

Cheshire

That the Sand Lizard used to occur on the Wallasey–Hoylake Wirral dunes is on the authority of several reliable naturalists including H. O. Forbes, L. Greening and R. K. Perry. Specimens critically examined by other herpetologists are attributed to Greening and C. S. Gregson, but these cannot be traced today. The most recent record, acceptable to N. F. Ellison (1959) and R. Wagstaffe (*pers. comm.*) is from *c.* 1933. The present author examined suitable terrain on the Wirral Peninsula in 1964, 1965 and 1966 with no success.

NORTHWEST WALES

The former presence of the Sand Lizard here rests upon the authority of H. E. Forrest (1907) or his correspondents. The validity of those reports cannot be proved today.

Anglesey

In 1961 A. J. Mercer (*pers. comm.*) described "Sand Lizards" seen at Newborough Warren. His drawings suggested *L. vivipara*, greenish individuals of which were found to be frequent there during the author's visits in 1963 and 1965.

Merioneth

Forrest (1941) records the species from Llwyngwril in 1934 and near Aberdovey in 1935, but these reports remain unsubstantiated. In 1965 and 1966 came reports from the Morfa Harlech and Morfa Dyffryn dunes by D. Proctor (*in litt.* and *pers. comm.*). His drawings did not show any diagnostic *L. agilis* features. A specimen taken by another naturalist in 1965 proved to be *L. vivipara* (*fide* Mrs. H. Wood), a species found to be abundant in both localities by the author.

Denbigh (and part of Caernarvon)

Forrest (1907) accepted P. Inchbald's report (1860), which pre-dates the time when the diagnostic characters of British lizards became well-known. Forrest (*op. cit.*) considered it doubtful that the species still existed there. No further reports are known to the author.

Flint

Prestatyn and the Point of Air, 1914, are Forrest (*Handbook of the Vertebrate fauna of North Wales*, n.d.) records which cannot be assessed today. Sand Lizards cannot be found there now, but there has been destruction of potential habitat.

ISLE OF MAN

No report of the presence of Sand Lizards in the Isle of Man is authenticated. Reports prior to about 1953 were reviewed by D. E. Allen and W. S. Cowin (1954) who were inclined to accept them despite R. Wagstaffe's note of caution in an editorial footnote to their paper. Early reports seem to originate with J. Train (no date, but prior to 1842) and were fostered by E. Forbes (1839). Since 1954 there have been further reports which have not been critically examined until now. Miss M. Quayle and E. Howarth separately reported the species from different localities, but without supporting evidence. In September 1962 the author showed Miss Quayle a rather green *L. vivipara* taken in her "Sand Lizard" locality (York Museum, 1966z99) and she declared it to be 'identical' to the specimen she had decided was a Sand Lizard after consulting M. Smith's work (1954). Another Ramsey school-teacher showed a preserved 'Manx Sand Lizard' which was also *L. vivipara.* The author searched lizard ground on Man on several occasions in 1962–4 but found only the Viviparous species. Enquiries at the Manx Museum revealed other erroneous recent records from Man. Although specimens labelled "Sand Lizard" have been lost (Mrs. C. Clarke, *in litt.*), photographs by H. Rogers labelled "Sand Lizard" were of *L. vivipara.* In 1959 Miss A. G. C. Grandison of the British Museum (Nat. Hist.) determined a presumed Sand Lizard as *L. vivipara,* for Miss Quayle (L. S. Garrad, *in litt.*).

SUMMARY

Records of the Sand Lizard *Lacerta agilis* L. substantiated by known specimens extant today have been received only from Southwest Lancashire, in Northwest Britain. Work is at present proceeding on the status of the species in Northeast England (Lincolnshire to Northumberland) and the author would be grateful for reports, references and information on the present whereabouts of any specimens.

The present author considers that the species has occurred in Cheshire (Wirral Peninsula) and may still be there, but he considers the reports from other districts referable to the Common or Viviparous Lizard *Lacerta vivipara* Jacquin wherever these have been critically examined.

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THE LEPIDOPTERA OF YORKSHIRE

(*continued from p.* 100)

Dyscia fagaria Thunb. (Grey Scalloped Bar).

Widely distributed over the moorland areas; although generally reported from the low-lying heaths there are several records for the higher moors.

61. Skipwith Common.
62. Strensall Common.
63. Bingley, St. Ives; Little Horton near Bradford; Hawksworth Moor, 1952; Skelmanthorpe, at Rusby Piece in 1911; Thorne Moor.
64. Ilkley Moor, 24th June 1950.

Gnophos obscurata Schiff. (Annulet).

Very local and now only recorded with any regularity on the coast in the Filey area.

61. Filey, frequently taken on the coast.
62. Pickering, in Gundale in 1963; Saltburn, 1915.
64. Grassington, Dib Scar up to 1918 and in 1956.

Bapta bimaculata Fabr. (White Pinion Spotted).

Not recorded since Porritt's List.

B. temerata Hubn. (Clouded Silver).

Very local but quite widely distributed.

62. Hackness, one larva in 1968; Pickering, in Gundale; Scarborough, larvae frequent in Raincliffe Woods, 1967.
63. Edlington Wood; Bradford district, 1968.
64. Bishop Wood; Harrogate.

Cabera pusaria Linn. (Common White Wave).

Generally distributed and often common.

C. exanthemata Scop. (Common Wave).

Also widely distributed but more local and rather less common than the previous species.

Ellopia fasciaria Linn. (Barred Red).

Widely distributed but rather local, presumably being restricted by the availability of Pine.

62. Hackness; Strensall Common.
63. Sheffield.
64. Bishop Wood; Harrogate; Hubberholme, 1910; Knaresborough.

Campaea margaritata Linn. (Light Emerald).

Generally distributed and often common in wooded areas.

Angerona prunaria Linn. (Orange Moth).

Not recorded since Porritt's List.

Semiothisa alternaria Hubn. (Sharp-angled Peacock).

This species was added to the Yorkshire list when H. N. Michaelis took a single specimen at Kilnsea Warren (61) in 1949. This remains the only record. It is assumed that it must have bred on the Sea Buckthorn which grows there so extensively but repeated working of the area has failed to reveal any further evidence of it.

S. liturata Clerck (Tawny-barred Angle).

Well distributed in pine woods, the melanic form *ab. nigrofulvata* has been recorded from Bishop Wood and Deffer Wood.

61. Skipwith Common.
62. Thornton-le-Dale.
63. Deffer Wood; Thorne Moor, 1909; Walton near Wakefield; Wyke.
64. Bishop Wood; Gateforth; Grass Wood, 1930; Harrogate.

Isturgia carbonaria Clerck (Netted Mountain Moth).

Not recorded since Porritt's List.

Itame wauaria Linn. (V-moth).

Not as common as formerly, perhaps due to a change in gardening methods. It is however, still widely distributed in gardens of well-established gooseberries and currants. The only record away from such cultivation is from Grass Wood (64).

Chiasmia clathrata Linn. (Latticed Heath).
Local in dry places but often common especially on the coast.
61. Spurn.
62. Burniston, common on the undercliffs; Robin Hood's Bay; Scarborough.
64. Drax; Malham, 1967; Michlefield; Selby area, on railway banks.
65. Constable Burton, common in 1960.

Theria rupicapraria Hubn. (Early Moth).
Often common on hedges but not recorded from some well-worked areas.
61. Selby area.
63. Doncaster; Huddersfield; Skelmanthorpe, 1921; Snaith.
64. Askham Bog; Copmanthorpe; Harrogate; Selby area.

Erannis aurantiaria Esp. (Scarce Umber).
This moth is by no means scarce, it is widely distributed particularly among Birch; a melanic form has been recorded from Elland (63).

E. marginaria Borkh. (Dotted Border)
Generally distributed and often common.

E. leucophaearia Schiff. (Spring Usher).
Well distributed in oak woods, many different varieties have been recorded.
61. Escrick.
63. Calverley; Chevet; Deffer Wood; Doncaster; Shipley Glen; Skelmanthorpe.
64. Bishop Wood; Brayton Barff; Copmanthorpe; Selby area.

E. defoliaria Clerck (Mottled Umber).
Generally distributed and often common, but it has not recently reached the numbers of former years when the trees were literally defoliated.

Anagoga pulveraria Linn. (Barred Umber).
Now very local in the County and usually scarce.
62. Gundale near Pickering; Scarborough, 30th May, 1968.
63. Edlington Wood, 1917.
64. Bishop Wood; Knaresborough, in Birkham Wood in 1962; Winterburn near Skipton in 1932

Plagodis dolabraria Linn. (Scorched Wing).
Widely distributed and frequently taken in small numbers.
61. Skipwith Common.
62. Hackness; Strensall Common; York.
64. Bishop Wood; Harrogate; Knaresborough; Kirkstall, 1956; Grassington, 1930; Scholes near Leeds.

Ennomos quercinaria Hufn. (August Thorn).
Very local and now occurs regularly in only one locality.
61. Filey, one at Muston in 1968; Everingham, 1923.
62. Pickering, frequently in Gundale.
64. Harrogate, one in 1946.

Deuteronomos alniaria Linn. (Canary-shouldered Thorn).
Well distrubted in the County and frequently recorded over a wide range.

D. fuscantaria Haw. (Dusky Thorn).
Also widely distributed but generally less common than the previous species.
61. Barlby, sometimes common at light; Burton Agnes, 1967; Muston near Filey, 1968.
62. Ampleforth, 1968; Pickering; Strensall.
63. Wath-on-Dearne; Wakefield, 1958.
64. Askham Bog; Bishop Wood; Gledhow; Harrogate; Kirkstall; Knaresborough, 1959; Selby.

D. erosaria Borkh. (September Thorn).
Widely distributed and frequently recorded though usually in small numbers.
61. Barlby; Selby; Skipwith Common.
62. Ampleforth, 1968; Strensall Common.
63. Halifax.
64. Bishop Wood; Brayton Barff; Harrogate; Scholes, 1968; Selby district.

Selenia bilunaria Esp. (Early Thorn).
Well distributed and often common. Melanic forms have been taken from Bishop Wood (64) and Doncaster (63).

S. lunaria Schiff. (Lunar Thorn).
Well distributed but seldom common.
62. Guisborough; Pickering, in Gundale.
63. Barnsley; Denby Dale, 1906; Skelmanthorpe, 1908.
64. Bolton Abbey, 1937; Denton Moors; Grassington, one larva in 1967; Harrogate; Knaresborough; Selby, 1934.

Apeira syringaria Linn. (Lilac Beauty).
Not often recorded but evidently fairly well distributed in the central part of the County.
61. Barlby; Skipwith Common.
64. Bishop Wood; Harrogate; Knaresborough; York district.

Gonodontis bidentata Clerk (Scalloped Hazel).
Widely distributed and often common. Melanic forms occur quite commonly in some areas.

Crocallis elinguaria Linn. (Scalloped Oak).
Widely distributed and sometimes common.

Colotois pennaria Linn. (Feathered Thorn).
Widely distributed and often common in well-wooded areas.

Opisthograptis luteolata Linn. (Brimstone).
Generally distributed and often common.

Cepphis advenaria Hubn. (Little Thorn).
The only known locality in the County is Edlington Wood (63) where it was common at the turn of the century. The only recent record was of a solitary female taken there on 14th June, 1958, from whose ova a short series was bred.

Epione vespertaria Thunb. (Dark Bordered Beauty).
The only known locality in Yorkshire, and certainly the best known locality in Britain if not the only one, is Strensall Common (62). In spite of frequent fires and regular visits by numerous collectors it continues to flourish there and over 20 were recorded (but not taken) during a recent Y.N.U. visit.

E. repandaria Hufn. (Bordered Beauty).
Local and seldom seen in any numbers but evidently fairly widely distributed.
61. Barlby, 1968; Skipwith Common.
62. Runswick Bay, 1959; Scarborough, 1967; Strensall Common.
63. Haw Park near Wakefield, 1911.
64. Askham Bog, common; Bishop Wood; Haddlesey near Selby.

Pseudopanthera macularia Linn. (Speckled Yellow).
Apart from a very old record from Malham (64) the only known locality is Grass Wood (64) where it still occurs and is often plentiful.

Lithina chlorosata Scop. (Brown Silver Lines).
Widely distributed and usually common where there is plenty of bracken.

Ourapteryx sambucaria Linn. (Swallow-tail).
Generally distributed and sometimes quite common both in built-up areas and in wooded districts, or wherever there is either Ivy or Elder.

Phigalia pedaria Fabr. (Pale Brindled Beauty).
Generally distributed and often common. The melanic form usually outnumbers the type.

Apocheima hispidaria Fabr. (Small Brindled Beauty).
Uncommon and seldom recorded. The best known locality in Yorkshire is Bishop Wood (64), but even there there was a gap of over fifty years before it was taken in 1966.
62. Great Ayton, rare before 1918; Strensall Common, one pupa dug on 17th September, 1959, and a male bred on 14th March, 1960.
63. Sheffield, once.
64. Bishop Wood, one on 5th March, 1966, two 18th March, 1966, and several in 1968.

Lycia hirtaria Clerck (Brindled Beauty).
What appears to be the last authentic record of this moth in Yorkshire is from Raincliffe Woods, Scarborough (62) in April, 1902.

Biston strataria Hufn. (Oak Beauty).

Widely distributed but not often common.

62. Buttercrambe Woods, 1933; Scarborough, 1900.
63. Deffer Wood, 1917; Doncaster.
64. Bishop Wood; Burley Woodhead, 1960; Brayton; Cambelsforth; Copmanthorpe; Gateforth; Harrogate; Knaresborough.

B. betularia Linn. (Peppered).

Generally distributed and often common. The type is rare in the County; the genetically dominant melanic form probably accounts for over 95% of the specimens recorded.

Hemerophila abruptaria Thunb. (Waved Umber).

Now scarce and local with only three recent records, all from the Eastern part of the County.

61. Hornsea Mere, April, 1912; Skipwith Common, one, 22nd May, 1960.
62. Pickering, one in Gundale, 18th May, 1964; Scarborough district, one in 1967; York, formerly in Bootham.

Boarmia roboraria Schiff. (Great Oak Beauty).

Not recorded since Porritt's List.

Cleora lichenaria Hufn. (Brussels lace).

Only recorded once since Porritt's List, from Raincliffe Woods near Scarborough (62) in the early part of the century.

C. rhomboidaria Schiff. (Willow Beauty).

Generally distributed and often common, even in built-up areas.

C. repandata Linn. (Mottled Beauty).

Widely distributed and often common; it shows a wide range of variation, both black and banded forms being taken.

Ectropis bistortata Goeze (Engrailed).

Fairly well distributed except in the more industrial areas; often common in large woods in the Spring.

E. crepuscularia Hubn. (Small Engrailed).

This is difficult to distinguish from the previous species and may also occur over a wide range; on the basis of the dates there are two records which seem reliable.

62. Kirby Moorside, 16th to 18th May, 1959.
64. Harrogate, 25th May, 1960 and subsequently bred from larvae feeding on larch.

E. consonaria Hubn. (Square-spot).

Not recorded since Porritt's List.

Aethalura punctulata Schiff. (Grey Birch).

Local but often common where it occurs.

61. Skipwith Common; Selby district.
62. Strensall Common.
64. Askham Bog; Bishop Wood; Ripon, at Queen Mary's Dubbs, 25th June, 1954; Selby district.

Ematurga atomaria Linn. (Common Heath).

Generally common on heathland throughout the County.

Bupalus piniaria Linn. (Bordered White).

Generally distributed throughout the pine-woods of the County and often very common therein. It is also taken sporadically in garden areas where odd pine trees grow.

ZYGAENIDAE

Zygaena filipendulae Linn. (Six-spot Burnet).

A local insect but of quite wide distribution and often common where it occurs.

61. Bishop Wilton; Filey; Kilnsea; Thixendale.
62. Helmsley; Malton; Pickering; Strensall Common.
63. Deffer Wood, rare in 1926; Keighley; Seckar Wood near Barnsley; Skelmanthorpe; Thorne Moor; Wakefield.
64. Apperley Bridge near Bell Busk; Askham Bog; Ferrensby; Harrogate.

(*to be continued*)

YORKSHIRE NATURALISTS' UNION EXCURSIONS IN 1969

LASTINGHAM V.C. 62 — 24th to 26th May

In spite of a poor weather forecast for the Whitsuntide weekend, two of our three days were brilliantly sunny and the meeting was thoroughly enjoyed. In all, one hundred and twenty five members and associates attended during the week-end representing nineteen affiliated Societies.

Our President, Miss C. Rob, took the Chair at the meeting for reports after tea at Lastingham Lodge, on the final day. Miss Crackles proposed a vote of thanks to Mr. Ian Lawrence, the Divisional Secretary, who had made the arrangements, and to the many local landowners who had so kindly allowed us to visit their land.

The southern part of the 10 km. square SE 79 was visited on the Saturday morning, when we followed the course of the Hole Beck north into the peaty, acid soils of Spaunton Moor. In the afternoon we moved south into SE 78 onto the wooded limestone escarpment of Spaunton banks which lies immediately south of Lastingham. The whole of Sunday was spent exploring the banks of the Seven valley, just south of Appleton-le-Moors and still in SE 78. The Monday excursion, again in SE 78, was to the delightfully unspoilt farmland and woodland which lies in the part of the Seven valley immediately west of Cropton.

Ornithology (A. J. Wallis): During the weekend 68 species were recorded, of which 43 occurred in both 10 km. squares covered (SE 78 and SE 79). Eleven were seen only in the more southerly square, mainly species of deciduous woodland, such as Tawny Owl, Jay, Garden Warbler and Chiffchaff. Of the 14 species seen only in square SE 79 the moorland habitat provided the majority as was to be expected. These included Red Grouse, Golden Plover, Curlew, Wheatear and Whinchat; the more mature woods close to Lastingham also included Nuthatch, Pied Flycatcher and Treecreeper not seen among the younger trees in square SE 78. Definite evidence of breeding was found for the following species: nest with eggs, or birds sitting and not disturbed, Carrion Crow, Blackbird, Song Thrush, Robin, Willow Warbler, Meadow Pipit, Linnet and Chaffinch; feeding young, Rook, Nuthatch, Treecreeper, Dipper, Pied Wagtail, Starling; fledged young, Tawny Owl — two young birds, looking very bedraggled after a heavy shower of rain, were seen in an alder tree with the parent bird close by, Swifts were seen visiting nesting holes, Tree Sparrows carrying nesting material, and a used nest of a Long-tailed Tit was found. Single Wood Warblers were heard and seen, one in each of the squares; Siskins were heard singing in square SE 79, and a female was picked up dead in square SE 78 though some way from the area covered by the various official routes. Spotted Flycatchers were numerous, especially in the immediate vicinity of both Lastingham and Appleton-le-Moors, while on the other hand Redstarts were few and far between in an area which would appear to be eminently suitable for them.

The full list of species recorded (with 78 or 79 in parenthesis to indicate species seen in only the one 10 km. square) is: Heron (78), Mallard, Sparrowhawk, Kestrel (79), Red Grouse (79), Partridge (78), Pheasant, Lapwing, Golden Plover (79), Snipe, Curlew (79), Herring Gull (78), Stockdove (78), Wood Pigeon, Turtle Dove (78), Cuckoo, Tawny Owl (78), Swift, Great Spotted Woodpecker (78), Skylark, Swallow, House Martin (79), Carrion Crow, Rook (78), Magpie, Jay (78), Great Tit, Blue Tit, Coal Tit (79), Marsh Tit (79), Long-tailed Tit, Nuthatch (79), Treecreeper (79), Wren, Dipper, Song Thrush, Blackbird, Wheatear (79), Whinchat (79), Redstart, Robin, Blackcap, Garden Warbler (78), Whitethroat, Willow Warbler, Chiffchaff (78), Wood Warbler, Goldcrest (79), Spotted Flycatcher, Pied Flycatcher (79), Dunnock, Meadow Pipit, Tree Pipit, Pied Wagtail, Starling, Greenfinch, Goldfinch, Siskin (79), Linnet, Redpoll, Bulfinch, Chaffinch, Yellowhammer, Reed Bunting (79), House Sparrow, Tree Sparrow.

Vertebrates other than birds (C. Simms): Traps were not employed, fishes and bats were not investigated. The recorder wishes to thank others for several clues and sightings. His own work was concentrated on Hutton Ridge and Spaunton Moor whilst the main party worked the Skipster and Bishop Hagg woods, so his woodland observations were confined to the Cropton Woods and Cropton Banks scrub on Monday. Despite ideal conditions few reptiles were seen on the moorlands; only Viviparous Lizards and Vipers were found where two other species (Grass Snakes and Slow Worms) have been recently reliably noted. The moorland edge yielded the newts *Triturus helveticus* and *T. vulgaris*, and the Common Frog was often seen in the sikes above Lastingham. M. Buckler and the recorder found early young of the lizard and a spent female viper on 23rd July in the slacks above Lastingham; as this report is being compiled other evidence of early viper broods in the district is to hand.

The mammals were not well worked; the most interesting observation being of ball nests of *Clethrionomys glareolus* in hazel stems at Cropton Banks. Molehills, a Common Shrew, a Stoat, an occupied Fox earth found by Mrs. Russell, abundant signs of Badgers in the Cropton woods (setts pointed out by Mr. Simpson), Rabbits and Hares noted by the conchologists and Grey Squirrels by Mr. Simpson concluded a rather disappointing list. No evidence was seen of Roe Deer or, amongst the rodents, of *Microtus*, *Rattus* or *Mus*. *Arvicola* and *Apodemus* were not handled, although there were indications of their presence.

Conchology (L. Lloyd-Evans): Fifty-two species of mollusca were taken during the weekend, thirty-two species being found in both grid squares. The following is a complete list with the localities and grid squares in which each species was taken:

1 = Spaunton Moor, 44/79
2 = Appleton-le-Moors, 44/78
3 = Cropton Banks, 44/78

Potamopyrgus jenkinsi (Smith), 1
Carychium minimum Müller, 1, 2
C. tridentatum (Risso), 1, 2
Lymnaea truncatula Müller, 1, 2
L. peregra (Müller), 2
Planorbis crista (L.), 3
Cochlicopa lubrica (Müller), 1, 2
C. lubricella (Stabile), 1, 2
Vertigo pygmaea (Drap.)
Lauria cylindracea (da Costa), 1, 2
Acanthinula aculeata (Müller), 3
Vallonia excentrica Sterki, 1, 2
Ena obscura (Müller), 3
Marpessa laminata (Montagu), 1, 2
Clausilia bidentata (Ström), 2
Cecilioides acicula (Müller), 3
Arianta arbustorum (L.), 1, 2
Helix hortensis Müller, 2
H. nemoralis L., 1, 2
H. aspersa Müller, 1, 2
Hygromia striolata (C. Pfeiffer), 1, 2
H. hispida (L.), 1, 2
Monacha cantiana (Montagu), 1, 2
Helicella itala (L.), 2
H. caperata (Montagu), 3
Discus rotundatus (Müller), 1, 2
Arion intermedius Normand, 1, 2
A. circumscriptus Johnston, 1, 2
A. fasciatus (Nilsson), 1, 2
A. hortensis Férussac, 2
A. subfuscus (Draparnaud), 2
Arion ater agg., 1, 2
Euconulus fulvus (Müller), 1, 2
Vitrea crystallina (Müller), 1, 2
V. contracta (Westerlund), 1, 3
Oxychilus cellarius (Müller), 1, 2
O. alliarius (Miller), 1, 2
Retinella radiatula (Alder), 1, 2
R. pura (Alder), 2
R. nitidula (Drap.), 1, 2
Vitrina pellucida (Müller), 1, 2
Milax budapestensis (Hazay), 1, 2
Limax maximus L., 1, 2
L. cinereoniger Wolf., 2
Lehmannia marginata (Müller), 1, 2
Agriolimax reticulatus (Müller), 1, 2
A. laevis (Müller), 1, 2
Sphaerium lacustre (Müller), 2
Pisidium casertanum (Poli), 2
P. obtusale (Lamarck), 2
P. milium Held, 2
P. subtruncatum Malm, 2

Flowering Plants (C. M. Rob): The position of Lastingham at the northern end of the limestone hills and on the edge of acres of heather moor, provided the botanists with plenty of good habitats which, but for the very late spring would have given a fine selection of flowering plants. As it turned out the woodland plants were more like those of Easter than Whitsun, with Primroses and dog-violets in profusion.

The moorlands which were explored on Saturday yielded little of interest. *Myrica gale* (Bog Myrtle) is plentiful in this part of the Yorkshire moors, although absent from most of those to the west of Blakey Rigg; *Drosera rotundifolia* (Common Sundew) grows in most of the damper areas and *Genista anglica* (Petty Whin), *Carex dioica* and *Equisetum sylvaticum* (Wood horse-tail) were all additions to the 10 km. square. Spaunton banks, the steep north-facing woodland to the south of the village, is largely new plantation, but here *Vicia sylvatica* (Wood vetch) was noted, also *Adoxa moschatellina* (Moschatel) both new to the square. In some wet ground near a small stream, a good patch of *Ranunculus lenormandi* was another good find; although not uncommon in the Pennine valleys the plant is very rare on the eastern uplands.

Both Sunday and Monday were spent in woodland to the south of the village, the woods visited, Skipster and Bishop Hagg, Cropton banks and Howlgate head, were of different ages, the most interesting being Cropton Banks. Here a number of the lime-loving plants of the district were noted, but generally in small patches; nowhere did one see *Convallaria* in the quantity generally found in this part of the county. *Neottia nidus-avis* (Birds nest orchid), *Ophrys insectifera* (Fly orchid), *Aquilegia vulgaris* (Columbine), *Paris quadrifolia* (Herb Paris) and *Melampyrum pratense* (Cow-wheat) were some of the best finds. *Narcissus pseudo-narcissus* was in a few places by the river. The hybrid Oxlip *Primula veris x vulgaris* was abundant, some of the plants in Cropton Banks being exceptionally fine. *Orchis mascula* (Early purple orchid) was in all the woods but the plants in Dawsons woods, which had been felled some years ago and now consist of overgrown coppice, were in glorious condition.

Orchis morio (Green winged Orchid) was seen in at least two places. This orchid, once not uncommon, has become rare in the last fifty years and this was one of the best finds of the day. *Ophioglossum vulgatum* (Adder's-tongue) was plentiful in one of the *O. morio* fields.

The weekend's work resulted in 16 additions to the *Atlas* for the northern square SE 79 and 19 to the southern one SE 78. As both squares had been fairly well worked in the past these numbers are very satisfactory.

Bryology (Mary Dalby): On Spaunton Moor above Lastingham village eleven species of sphagna were gathered: *S. palustre, S. papillosum, S. compactum, S. recurvum, S. cuspidatum, S. tenellum, S. subsecundum var. auriculatum, S. fimbriatum, S. rubellum, S. capillaceum* and *S. plumulosum*. In addition *Odontoschisma sphagni, Mylia anomala, Nardia compressa, Lepidozia setacea* and *Cephalozia connivens* were among the more interesting hepatics noted. Wet flushes among the cotton grass produced *Drepanocladus revolvens, D. exannulatus, Aulacomnium palustre* and, rather surprisingly, *Cirriphyllum piliferum* woven into the dryer tussocks.

Appleton-le-Moors was visited on the Sunday; here the floor of an old quarry yielded such species as *Brachythecium albicans, Mnium cuspidatum, Climacium dendroides, Ctenidium molluscum* and in limestone turf nearby Miss Robertson found *Thuidium philiberti*. On the banks of the lane to Hagg Sitt Wood were *Campylium chrysophyllum, Encalypta vulgaris c.fr., Mnium stellare* and *Eurhynchium murale*. Another interesting habitat was a wet limestone outcrop near the river where *Anomodon viticulosus* hung in great curtains. *Porella platyphylla, Solenostoma triste, Leiocolea turbinata, Metzgeria furcata, Neckera complanata, Omalia trichomanoides, Fissidens cristatus* and *Grimmia apocarpa* were found. Dr. Cockram also noted *Fissidens viridulus*, and Miss Robertson found *Orthotricum affine* and *O. diaphanum*.

On Monday at Cropton Banks Wood Miss Robertson found a number of calcicole species including *Metzgeria pubescens, Neckera crispa* and *Omalia trichomanoides* with fruit. She also discovered *Seligeria recurvata* and *Frullania dilatata*.

Mycology (W. G. Bramley): The cold Spring held back a good many of the smaller fungi one would have expected to see at this date. The small Discomycetes were either absent or in very young condition and the number and extent of the rusts was sparse. Little was expected from the moors above Lastingham though the slacks yielded a few characteristic species, e.g. *Mitrula paludosa, Omphalina ericetorum* and a few fructifications of *Sclerotinia curreyana*. Near the village a few leaves of *Anemone* with the white pustules of *Ochropsora ariae* were discovered amongst the commoner *Puccinia fusca* and indeed small isolated patches were seen on all three days. There appear to be only two published records in the past three decades at Pickering and Coxwold but I have seen it at Aysgarth. Dr. Sledge informs me that F. A. Mason showed it to him at Colt Park Wood in 1930.

Within a hundred yards of setting out at Appleton-le-Moors a small patch of *Adoxa* was found badly attacked by *Ramularia adoxae*, the second Yorkshire record. Last year it turned up near Thornton Dale and there are only two published Scotch records and one specimen from England and one from Wales at Kew. Miss Rob passed on to me a stem of Marjoram bearing aecidia of *Puccinia menthae*. So far only uredospores have been found occasionally on this host in the county. Crossing the fields at the end of the day a few St. George's mushrooms were taken and added flavour to the next morning's breakfast. Rain on Monday was not conducive to collecting but the second record for the county of *Massarina alni* was made near Cropton Mill on fairly recently cut branches of *Alnus*.

* Not in *Catalogue of Yorkshire Fungi* for V.C. 62.

† Not in *Catalogue of Yorkshire Fungi*.

A = Appleton-le-Moors
C = Cropton Mill and valley
L = Lastingham

**Plasmopara pusilla* (de Bary) Schroet., A.
Colpoma quercinum (Pers.) Wallr., A.
**Dasyscypha apala* (B. & Br.) Dennis, L.
**D. grevillei* Mass., on *Petasites* stems, A.
**Microscypha grisella* (Rehm) Lyd., on *Pteridium*, A.
Mitrophora semilibera (DC.) Lév., A.
Mollisia discolor (Mont. & Fr.) Phill., on *Quercus* twig, A.
Tapesia rosae (Pers. ex Fr.) Fuckel, on *Rosa canina* A, certe W. D. Graddon.
†*Massarina alni* (Otth) Sacc., on *Alnus*, C.
Ochropsora ariae (Fuckel) Ramsb., 1 on *Anemone*, A. C. L.
Puccinia menthae Pers., 1 on *Origanum*, A.
**Entyloma ficariae* (Berk.) F. van Wald., on *Ranunculus ficaria*, A.
Pseudohiatula stephanocystis Hora, on buried cones of *Pinus*, L.
Pistillaria uncialis (Grev.) Cost. et Dufour, on Umbellifer stem, C.
†*Botrytis globosa* Rabenh., on *Allium ursinum*, A. C.
†*Ramularia adoxae* (Rabenh.) Karst., on *Adoxa*, A.
Steganosporium pyriformis (Hoffm.) Corda, on *Acer*, A.

BRANDESBURTON GRAVEL PITS, V.C. 61 — 7th June

Mr. E. Chicken, the Divisional Secretary, had prepared a most helpful map to guide us to the twelve flooded gravel pits in the area around Brandesburton and we were able to see an interesting range of habitats from recently exposed sand to old pits with plant and animal communities which had been established for many years.

Thirty-five members were present, representing thirteen affiliated societies. The President, Miss C. Rob, took the Chair at the Meeting for Reports after tea at the 'Black Swan', Brandesburton. A vote of thanks to Mr. Chicken for his work in organising and leading the excursion, and to the landowners, Hoveringham Gravels Ltd. was expressed by Mrs. A. C. M. Duncan.

Ornithology (J. Hesslewood): Thanks to Mr. Chicken's excellent sketch maps, the ornithologists were able to split up and visit all twelve gravel pits and see a total of 50 species.

Water birds were scarce in view of the large area of water available, the only ducks seen being a pair of Mallard and Tufted Duck. Two Great Crested Grebes were recorded with two pairs of Mute Swan and one Canada Goose while Moorhen and Coot were also very few. Two Little Ringed Plover were seen together with five Turtle Doves in one area and Pied Wagtails were observed carrying nesting material. Sedge Warblers were vocal and one area of *Phragmites* also held Reed Warblers. Cuckoos, Wood Pigeon, Wren, Dunnock, Blackcap, Whitethroat, Willow Warbler, Robin, Blue Tit, Chaffinch and Bullfinch were seen in wooded areas surrounding some of the pits and Lapwing were present in flooded areas. Tree Sparrows and Sand Martins were numerous in the pits but only two Swifts were seen.

Other species recorded were Kestrel, Partridge, Black-headed Gull, Herring Gull, Great Black-backed Gull, Common Gull, Skylark, Swallow, House Martin, Yellow Wagtail, Blackbird, Song Thrush, Corn Bunting, Yellowhammer, Reed Bunting, Greenfinch, House Sparrow, Starling, Magpie, Jackdaw, Rook and Carrion Crow.

Conchology (K. Moorhouse): Four different gravel pits produced molluscs. In the first one, immediately south of the farmstead 'Hempholme' we found *Helix aspersa, Cepaea nemoralis, Sphaerium corneum, Bithynia tentaculata, Potamopyrgus jenkinsi, Lymnaea stagnalis, L. peregra, Planorbis planorbis.*

In a pool just north of 'Burshill' were *Helix aspersa, Cepaea nemoralis, Monacha cantiana, Oxychilus cellarius, Helicella caperata, Agriolimax reticulatus, Lymnaea stagnalis* and *Anodonta anatina.*

The third area examined was a pit adjacent to 'Barff House'. Here we saw *Arion ater, Hygromia striolata, Oxychilus alliarius, Planorbis albus, Euconulus fulvus* and large quantities of *Anodonta anatina*. From another one alongside the Brandesburton-Catwick road, we recorded *Arion ater, Arion hortensis, Arion intermedius, Agriolimax laevis, A. reticulatus, Arion circumscriptus, Oxychilus cellarius, Lymnaea peregra, Planorbis corneus* and *Sphaerium corneum.*

Entomology (Mr. Wade): The warm and sunny weather was suitable for insects and Damsel, Dragon, May and Caddis Flies were on the wing.

Lepidoptera recorded were *Pieris brassicae, P. napi, P. rapae,* the Orange Tip (*Euchloë cardamines*), the Wall (*Pararge megera*), the Small Copper (*Lycaena phlaeas*), the Small Tortoiseshell (*Aglais urticae*), and the larvae of the Garden Tiger moth (*Arctia caja*), the Burnet Moth (*Zygaena filipendulae*), the Quaker Moth (*Agrochola macilenta*) and the adult Silver Ground Carpet Moth (*Xanthorhoë montanata*).

Vascular Plants (E. Crackles): A number of gravel pits between Hempholme and Catwick were visited. The most interesting species noted were *Alopecurus aequalis* (Orange Foxtail) and *Eleocharis uniglumis*, both in the same area of shallow pools and marsh, to the south-east of Brandesburton; *Epilobium palustre* (Marsh Willow-herb), *Parnassia palustris* (Grass of Parnassus) and *Zannichellia palustris* (Horned Pondweed) also occur in the same locality.

Species seen in or at the margins of the water-filled pits include: *Equisetum fluviatile* (Water Horsetail), *E. palustre* (Marsh Horsetail), *Ranunculus sceleratus* (Celery-leaved Crowfoot), *Hippuris vulgaris* (Mare's-tail), *Polygonum amphibium* (Amphibious Bistort), *Veronica beccabunga* (Brooklime), *Alisma plantago-aquatica* (Water-Plantain), *A. lanceolatum, Elodea canadensis* (Canadian Pondweed), *Potamogeton natans* (Broad-leaved Pondweed), *P. lucens* (Shining Pondweed), *P. crispus* (Curled Pondweed), *Groenlandia densa* (Opposite-leaved Pondweed), *Typha angustifolia* (Small Bulrush), *T. latifolia* (Bulrush), *Scirpus lacustris* (Lake Clubrush), *S. tabernaemontani* (Glaucous Lake Club-rush) and *Eleocharis palustris* (Common Spike-rush). *Lythrum salicaria* (Purple Loosestrife) and *Eupatorium cannabinum* (Hemp Agrimony) were recorded at one pit near Hempholme, whilst *Ranunculus aquatilis* ssp. *pseudofluitans* and *Myriophyllum spicatum* (Spiked Water-milfoil) occurred in a nearby drain.

Species recorded on the dry gravels included: *Geranium pyrenaicum* (Mountain Cranesbill), *Papaver somniferum* (Opium Poppy), *Arabis hirsuta* (Hairy Rock-cress) and *Cerastium arvense* (Field Mouse-ear Chickweed) in pits near Hempholme; *Erophila verna* (Whitlow Grass), *Cerastium glomeratum* (Sticky Mouse-ear Chickweed) and *Catapodium rigidum* (Hard Poa) in a pit near Brandesburton. A number of plants of *Papaver argemone* (Long Prickly-headed Poppy) were seen in a pit between Brandesburton and Catwick, together with *Erodium cicutarium* (Storksbill), *Scleranthus annuus* (Annual Knawel) and *Lycopsis arvensis. Senecio squalidus* (Oxford Ragwort) and *Geranium pusillum* were seen in another pit in this vicinity. From only one pit, near to Brandesburton, came reports of such calcicoles as *Anthyllis vulneraria* (Kidney Vetch) and *Centaurea scabiosa* (Greater Knapweed).

Bryology (Mary Dalby): Miss Robertson and Miss Hartley collected the following species: *Marchantia polymorpha, Riccardia sinuata, R. pinguis, Pellia endiviifolia, Atrichum undulatum, Ceratodon purpureus, Dicranella varia, Barbula unguiculata, B. fallax, Grimmia apocarpa, Funaria hygrometrica, Bryum pseudotriquetrum, B. bicolor, Leptobryum pyriforme, Cratoneuron filicinum, Drepanocladus aduncus, Acrocladium cuspidatum, Brachythecium rutabulum* and *Eurhynchium swartzii.*

UPPER DERWENT VALLEY, V.C. 63 — 21st June

The Upper Derwent Valley is a particularly beautiful part of V.C. 63 and our meeting was held in superb weather. Twelve affiliated societies were represented by the eighteen people present.

We were fortunate to have with us a knowledgeable local botanist in the person of Mr. Waite, of the Sorby Natural History Society, who showed us the fast diminishing remnants of Bearberry (*Arctostaphylos uva-ursi*) in this part of Yorkshire. After tea, we were shown it again, in excellent condition, high up behind the Ladybower Inn, a few miles from the Yorkshire site, but just within Derbyshire.

The Chair was taken by Mr. G. Shaw at the meeting for reports, after tea at the Ladybower Inn. A vote of thanks to Mr. R. Crossley, the Divisional Secretary, for organising the day, was proposed by Mr. C. Disbrey.

Ornithology (C. Disbrey): The following species were seen: Kestrel, Red Grouse Lapwing, Golden Plover, Snipe, Curlew, Common Sandpiper, Lesser Black-backed Gull, Woodpigeon, Swift, Skylark, Swallow, Carrion Crow, Magpie, Jay, Great Tit, Blue Tit, Wren, Dipper, Mistle Thrush, Song Thrush, Ring Ouzel, Blackbird, Wheatear, Whinchat, Robin, Garden Warbler, Willow Warbler, Goldcrest, Meadow Pipit, Tree Pipit, Pied Wagtail, Grey Wagtail, Starling, Greenfinch, Linnet, Redpoll, Chaffinch, House Sparrow and Black-headed Gull.

Entomology (R. Crossley): As was to be expected in this type of moorland locality, insects were not generally plentiful and neither was there much variety. It was too early for most Heteroptera and the bugs seen were all nymphs with the exception of the ground-dwelling predator *Saldula saltatoria* L. which was found on one of the paths. Amongst stones by the stream were nymphs of a saldid species, probably *scotica* and in the same habitat were the ground beetles *Nebria rufescens* (Stroem.), and *Bembidion atrocoeruleum* Steph. The very handsome burying beetle *Necrophorus vespilloides* Hb. was found on a dead grouse and the longhorn *Rhagium mordax* (D.G.), was captured on a rowan. This solitary rowan tree near the stream was flowering profusely and it acted as a magnet in the bright sunshine for many flying insects, principally hover flies, and most of my collecting was done at that point. All the flies taken were common and likely to be found in any type of habitat. The one exception was the handsome moorland fly *Sericomyia lappona* L., and also seen was its more widely distributed relative *S. silentis* Harris. The others, listed purely for record purposes, were: *Platychirus manicatus* Mg., *P. albimanus* Fab., *P. angustatus* Zett., *Melanostoma scalare* Fab., *Sphaerophoria menthastri* L., *Syrphus cinctellus* Zett., *Liogaster metallina* Fab., *Chrysogaster hirtella* Loew, *Eristalis pertinax* Scop., *E. nemorum* L., *Helophilus pendulus* L.

The sawflies *Stromboceras delicatulus* (Fall.), and *Tenthredo moniliata* Klug., were also taken here.

Mr. P. Skidmore kindly identified the ground beetles and sawflies for me.

Vascular Plants (C. B. Waite): Crossing Slippery Stones Bridge to the Yorkshire side of the river, the steep hillside immediately in front consisted mainly of:

Nardus stricta
Deschampsia flexuosa
Festuca ovina
Galium saxatile
Potentilla erecta
Luzula campestris
Vaccinium myrtillus

Low-lying bog, formed between *Molinia caerulea* carried *Eriophorum angustifolium* and *E. vaginatum*, with a fairly large area of *Carex rostrata*, in addition to:

Carex panicea
C. nigra
C. echinata
Scirpus caespitosus
Hydrocotyle vulgaris
Erica tetralix
Oxycoccus palustris
Cardamine flexuosa
Ranunculus flammula
R. lenormandi
Galium palustre
Viola palustris
Anthoxanthum odoratum

As the hillside closed in, the steeper sides by the river were cut by small streams and wet flushes, most of which contained:

Cirsium palustre
Chrysosplenium oppositifolium
Stellaria alsine
Montia verna
Lysimachia nemorum
Cardamine pratensis
Epilobium palustre
Carex laevigata
C. demissa
Equisetum palustre

Pteridium aquilinum was predominant on the lower hill slopes, leading up to moorland, interspersed with *Calluna vulgaris*, *Vaccinium vitis-idaea*, *Carex pilulifera* and *Deschampsia flexuosa*. At Broomhead Clough, the lower section near the river yielded:

Betula verrucosa
Sorbus aucuparia
Ilex aquifolium
Quercus sessiliflora
Corylus avellana
Holcus mollis
Oxalis acetosella
Ranunculus repens
Rumex acetosa
Nasturtium microphyllum
Bellis perennis
Dryopteris austriaca
Blechnum spicant
Athyrium filix-femina

In Stainery Clough the party visited the one known plant of Bearberry (*Arctostaphylos uva-ursi*), which was dead. Crossing to the better station at the side of the path up the Derwent, just beyond the Stainery Clough confluence, the path had been cut back, causing loss of several plants. Apart from this, three or four plants were found completely dead, known to have been perfectly healthy a year or two ago. A diligent search produced three plants, but the prospects of survival at this station are not good.

Following tea and the meeting at Ladybower Inn, a small party climbed the hill at the back of the Inn to the excellent Bearberry station (in Derbyshire) under the

Edge behind Robin Croft. Here the plant formed a hanging carpet at the small quarry face — in fruit, sparingly. The patches higher up the open hillside seemed to have increased, and were very healthy.

Bryology (E. Thompson): When the meeting commenced in the Upper Derwent Valley four members of the Bryological Section were present. At Slippery Stones the party crossed the bridge into Yorkshire where serious collecting began.

Here bogs by the infant river held a surprising amount of *Mnium longirostrum*, with its erect fertile shoots being most obvious. Present also was a good amount of *Philonotis caespitosa*. Signs of more basic conditions were revealed with the appearance of *Cratoneuron commutatum* on wet ledges just above the bogs. Narrow moorland cloughs joined the main valley at intervals but only one was explored. This had some fine wet cliffs that were festooned with masses of *Hookeria lucens* and the hepatic *Scapania undulata*. Dense cushions of the obscure but interesting moss *Amphidium mougeotii* also occurred. On rocks in the tributary stream *Brachythecium rivulare* and *Dichodontium pellucidum* were dominant. Only two species of Sphagnum were present in any quantity. These were sent to Miss M. Dalby who duly named them *S. subsecundum* and *S. fimbriatum*.

For a large area like this the list of bryophytes found is obviously not complete and most members felt that given time the district could provide more. Thanks are due to Mrs. M. Gow, Miss Robertson, Miss M. Dalby, Mr. G. A. Shaw and Mr. F. E. Branson for their kind help in various ways.

Mosses and liverworts found but not mentioned above are listed below:

MUSCI

Acrocladium cuspidatum
A. stramineum
Aulacomnium palustre
Atrichum undulatum
Bryum pseudotriquetrum
Dicranella heteromalla
D. palustre
Drepanocladus fluitans
D. revolvens
Fissidens taxifolius
Hyocomium flagellare
Isopterygium elegans
Orthodontium lineare
Pohlia wahlenbergii

HEPATICAE

Calypogeia fissa
Conocephalum conicum
Chiloscyphus polyanthos
Cephalozia bicuspidata
Lophozia ventricosa
Gymnocolea inflata
Pellia epiphylla

Nomenclature according to the current census catalogues.

JERVAULX ABBEY, EELMIRE AND SWINTON PARK, V.C. 65

Saturday, 5th July and Sunday, 6th July

This two-day meeting was blessed with excellent weather throughout. Seventy-five members in all, representing twenty member societies were present. Saturday was spent visiting the grounds of Jervaulx Abbey and Eelmire. On the Sunday, a last-minute rearrangement of plans, due to the much regretted and untimely death of Lady Ropner, who was to have been our guide at Camphill, resulted in our visiting the banks of the Ure to the north of Masham in the morning, and the grounds of Swinton Castle in the afternoon.

The President, Miss C. M. Rob, was in the Chair for the meeting for reports after tea at the King's Head, Masham. Mr. Ian Lawrence expressed thanks to Mrs. J. Holloway, the Divisional Secretary, for planning and running the weekend so effectively and to Lady Swinton and Col. Christie of Jervaulx, for so kindly allowing us to visit their estates.

Ornithology (G. E. Alderson): Great Spotted Woodpecker was seen at Jervaulx and a number of the commoner species. The River Ure had Oystercatchers, Lesser Black-backed Gull, Sandpiper, Mallard and Pied Wagtail. Spotted Flycatchers were seen feeding young. Redshank were at the edge of shallow water near the river.

At Eelmire, woodland and scrub produced Turtle Dove, Bullfinch, Greenfinch, Curlew, Willow Warbler and Pheasant. A keeper's 'larder' had three Carrion Crows, a Jay and two Stoats on the barbed wire. Tufted Duck flew over and Mallard had young on the pool in the woodland.

Sunday was spent upstream along the river bank at Masham and in the grounds of Swinton Castle in the afternoon. The river at Masham had Dipper, Mallard, Herring Gull, Black-headed Gull, Curlew, Reed Bunting, Sandpiper, Pied Wagtail and a Moorhen with eggs. A pair of Great Crested Grebes were on the flooded gravel pit nearby. At Swinton, the only Raptores of the weekend were a pair of Kestrels. The usual feral Canada Geese were present on the Park waters, with young birds of the year. A Jay was heard in the woodland and an owl being mobbed.

Other species seen or heard were Carrion Crow, Jackdaw, Snipe, Coot, Partridge, Swift, Swallow, House Martin, Yellowhammer, Tree Creeper, Linnet, Blackcap, Whitethroat, Garden Warbler, Chiffchaff, Robin, Willow, Coal, Blue and Long-tailed Tits, Grey Wagtail, Meadow Pipit, Wren, House and Tree Sparrow, Hedge Sparrow and Heron. Sixty-six species were recorded in the composite list for the weekend.

Mammals and Amphibians (G. Alderson): Dr. Lloyd Evans reported seeing both Smooth Newts and Crested Newts and Toads by the ponds at Jervaulx. Toads were also recorded from Swinton Park and Common Frog in marshy ground near the Ure at Masham.

Rabbits were seen by two people only. Stoats were on a keepers' gibbet.

Conchology (L. Lloyd-Evans): Fifty-seven species were taken during the weekend at the following localities:

1 = Jervaulx and Eelmire, 44/18
2 = Banks of River Ure north of Masham, 44/28
3 = Swinton Park, 44/27

Theodoxus fluviatilis (L.), 2
Valvata cristata Müller, 1
Potamopyrgus jenkinsi (Smith), 2
Carychium minimum Müller, 1, 2, 3
C. tridentatum (Risso), 1, 2, 3
Lymnaea truncatula (Müller), 1, 2
L. palustris (Müller), 1
L. peregra (Müller), 2, 3
Planorbis leucostoma Millet, 1
P. albus Müller, 1, 3
P. crista (L.), 1, 3
Ancylus fluviatilis Müller, 2
Segmentina complanata (L.), 3
Succinea pfeifferi Rossmässler, 1, 2
Cochlicopa lubrica (Müller), 1, 2, 3
C. lubricella (Stabile), 1
Columella edentula (Drap.), 2
Vertigo pusilla Müller, 1
Lauria cylindracea (da Costa), 1
Vallonia excentrica Sterki, 1
V. costata (Müller), 1
V. pulchella (Müller), 2
Ena obscura (Müller), 1
Marpessa laminata (Mont.), 2
Clausilia bidentata (Ström), 1, 2
Cecilioides acicula (Müller), 1
Helix hortensis Müller, 1
H. nemoralis L., 1
H. aspersa Müller, 1
Hygromia striolata (C. Pfeiffer), 1, 2, 3
Monacha granulata (Alder), 1, 2
Discus rotundatus (Müller), 1, 2, 3
Arion intermedius Normand, 1, 2, 3
A. circumscriptus Johnston, 1, 2
A. fasciatus (Nilsson), 1, 2, 3
A. hortensis Férussac, 1, 3
A. subfuscus (Drap.), 1, 3
A. ater agg., 1, 2, 3
Euconulus fulvus (Müller), 1, 2, 3
Vitrea contracta (Westerlund), 1, 2
V. crystallina (Müller), 2, 3
Oxychilus cellarius (Müller), 1, 2
O. alliarius (Miller), 1, 2, 3
O. helveticus (Blum), 1
Retinella pura (Alder), 1, 2
R. nitidula (Drap.), 1, 2
R. radiatula (Alder), 2, 3
Vitrina pellucida (Müller), 1, 2
Limax maximus L., 1, 3
Lehmannia marginata (Müller), 3
Agriolimax reticulatus (Müller), 1, 2, 3
A. laevis (Müller), 1, 2, 3
Pisidium personatum Malm, 1, 2
P. milium Held, 1, 3
P. subtruncatum Malm, 1
P. nitidum Jenyns, 1, 3
P. casertanum (Poli), 3

Flowering Plants (C. M. Rob and Mrs. J. Holloway): The botanists had a very enjoyable two days, the weather perfect and the routes chosen to give a wide variety of habitats. Saturday morning was spent in the grounds of the ruined abbey of Jervaulx where, unlike most ruins in these days, the walls were a fine sight with a wide variety of species, native and introduced. *Minuartia hybrida* (Fine-leaved Sandwort) was plentiful and in fine condition, *Cheiranthus cheiri* (Wallflower) and *Antirrhinum majus* (Snapdragon) in good flower were in several places. *Echium vulgare* (Vipers Bugloss), *Lactuca virosa* (Great Lettuce), *Arabis hirsuta* (Hairy Rockcress), *Geranium lucidum* (Shining Cranesbill), *Origanum vulgare* (Wild Marjorum), *Verbasum thapsus* (Great Mullein) and both *Asplenium trichomanes* (Common Spleenwort) and *A. ruta-muraria* (Wallrue) were also abundant. A list of 170 species was compiled in and about the Abbey ruins.

After lunch and a short visit to some ponds at the south end of the park the party moved to Eelmire. The pool here is completely surrounded by dense scrub and the party owed grateful thanks to the Jervaulx Estate for the path cut for their benefit. At Eelmire *Cladium mariscus* (Great Fensedge) completely encircles the pool. This is the only known station for this rare Yorkshire plant in the North Riding and confirmation of Thwaites' 1902 record was perhaps the most notable botanical result of the meeting. In addition *Schoenus nigricans* (Black Bogrush), ten species of *Carex* including *C. lepidocarpa*, *C. vesicaria* and *C. elata*, *Campanula glomerata* (Clustered Bellflower) and *Dryopteris carthusiana* (Narrow Buckler-fern) were recorded.

Because of the tragic death of Lady Ropner in a road accident the previous week the visit to Camphill was cancelled; instead the party explored the bank of the River Ure from Masham bridge upstream by way of Marfield almost to Low Mains farm, an area noted for its lime-loving plants. Gravel abstraction workings have changed this bit of ground and the list of plants noted reflects the changes caused by modern methods of quarrying. The greater part of the more interesting plants appear to have gone; of those remaining *Paris quadrifolia* (Herb Paris), *Thalictrum flavum* (Greater Meadow-rue) and *Galeobdolon luteum* (Yellow Archangel) were the most noteworthy.

After lunch the party moved to the grounds and lake at Swinton, a complete contrast to the calcareous grassland of the river banks, with calcifuge plants such as Bilberry and *Blechnum spicant* (Hard-fern). Both White and Yellow Water-lily were in the lake while other species included *Menyanthes trifoliata* (Bog-bean), *Polygonum amphibium* (Amphibious Bistort) and *Poa nemoralis* (Wood Meadow Grass), the best find of the afternoon being a small stand of *Pyrola minor* (Common Wintergreen).

Bryology (F. E. Branson): I only attended this meeting for one day, Sunday, 6th July but did not go with the main party. Three of us visited Eelmire, walking from the road to the lake by a rough field track. The area was most disappointing bryologically and no species other than common ones were seen.

In marshy ground were quantities of *Cratoneuron filicinum* and *Acrocladium cuspidatum* which seemed to be the two most abundant species, also a little *Climacium dendroides, Campylium stellatum* and *Leptodictyum riparium.* On the edge of the lake was a nice patch of *Marchantia polymorpha* with a number of male heads.

The other species seen are as follows:

HEPATICAE

Lophocolea bidentata

MUSCI

Funaria hygrometrica c fr.
Bryum argenteum
Mnium hornum
Fissidens taxifolius
Tetraphis pellucida
Dicranoweissia cirrata c fr.
Hypnum cupressiforme and var. *resupinatum*
Brachythecium rutabulum c fr.
Pseudoscleropodium purum
Camptothecium sericeum
Eurhynchium swartzii
Cratoneuron commutatum var. *commutatum*
Bryum capillare c fr.
Mnium undulatum
Mnium punctatum
Orthodontium lineare c fr.
Grimmia apocarpa
Amblystegium serpens c fr.
Thuidium tamariscinum
Rhytidiadelphus squarrosus
Eurhynchium praelongum
Ctenidium molluscum

Nomenclature follows *Census Catalogue of British Mosses* (3rd edition) by E. F. Warburg and *Census Catalogue of British Hepatics* (4th edition) by J. A. Paton.

Another party visited the Ure banks at Masham and Swinton Hall Park. Mr. J. Knight found *Schistostega pennata* in a sandstone quarry and Miss Robertson reported *Leskea polycarpa.*

HALTON GILL, V.C. 64 — 19th July

Forty members, representing fifteen affiliated societies, enjoyed this excursion in excellent weather. The valleys of both the Foxup and Cosh becks were investigated by different parties. The President, Miss C. Rob, took the Chair at the meeting for reports, after tea at the 'Falcon Hotel', Arncliffe. A vote of thanks to Miss H. Lefèvre, the Divisional Secretary, who had organised the meeting and to the landowners whose property we had explored, was proposed by Mr. Kemsley. Mrs. A. C. M. Duncan voiced the opinion of all members when she warmly thanked our President, Miss Rob, for giving so much of her time and expert guidance at our Field Meetings in 1969.

Ornithology (A. C. M. Duncan): The ornithologists divided into two parties so that both the Foxup and Cosh becks could be explored. The day was mainly cloudy with a strong westerly wind which made the birds keep to cover, but by the afternoon conditions had improved somewhat and the birds were easier to see in the sunshine.

The list of species seen totalled 44, including a number with young. Those most noteworthy were: Oystercatcher, which has been known to nest in this dale for a number of years now; Golden Plover; Raven; Yellow Wagtail (quite numerous); Twite; and Grey Wagtail.

Except for rabbits, hares, a shrew (found dead) and frogs, no other vertebrates were recorded.

Conchology (L. Lloyd-Evans): The following thirty-six species of mollusca were taken:

Carychium minimum Müller
C. tridentatum (Risso)
Lymnaea truncatula (Müller)
Ancylus fluviatilis Müller
Succinea pfeifferi Rossmässler
Cochlicopa lubrica (Müller)
Pyramidula rupestris (Drap.)
Columella edentula (Drap.)
Vertigo pygmaea (Drap.)
Lauria cylindracea (da Costa)
Ena obscura (Müller)
Clausilia bidentata (Ström)
C. dubia Drap.
Balea perversa (L.)
Arianta arbustorum (L.)
Helix hortensis Müller
Hygromia striolata (C. Pfeiffer)
H. hispida (L.)
Monacha granulata (Alder)
Discus rotundatus (Müller)
Arion intermedius Normand
A. circumscriptus Johnston
A. fasciatus (Nilsson)
A. hortensis Férussac
A. subfuscus (Drap.)
A. ater agg
Vitrea crystallina (Müller)
V. contracta (Westerlund)
Oxychilus cellarius (Müller)
O. alliarius (Miller)
Retinella radiatula (Alder)
R. nitidula (Drap.)
Vitrina pellucida (Müller)
Lehmannia marginata (Müller)
Agriolimax reticulatus (Müller)
A. laevis (Müller)

Lepidoptera (H. Pickup): One specimen of Grey Mountain Carpet (*Entephria caesiata*) was seen high up the Foxup beck and two specimens of Silver-Ground Carpet (*Xanthorhoë montanata*) by the Cosh beck where many Chimney Sweepers (*Odezia atrata*) were also seen. No other Lepidoptera were noted owing to the windy conditions which prevailed throughout most of the day.

Flowering Plants (C. M. Rob): Any meeting held in the limestone valleys is assured of success, given reasonable weather. On this occasion the party left Foxup in a shower with heavy clouds on the hill-tops but the clouds soon dispersed and the day got steadily better making the last field meeting of the year a most enjoyable outing.

About 235 species of flowering plant were recorded during the day and 17 of these are additions to the 10 km. square in the *Atlas*. Most of these additions were common plants which had been overlooked in the past, *Aphanes arvensis* (Parsley Piert), *Lolium multiflorum* (Italian Ryegrass) and *Chenopodium album* (White Goosefoot) being three of the very common species added. More interesting were several plants of *Platanthera chlorantha* (Greater butterfly Orchid) and *Rumex longifolius* (Butter Dock), the latter growing as expected near several of the many barns which are a feature of the Dales. *Saxifraga aizoides* (Yellow Saxifrage) was in fine condition in one place by Foxup beck and a few plants of *Sedum villosum* (Hairy Stonecrop) were seen near by. *Carex acutiformis* occurred in one small gill in the Cosh beck valley, *Gymnadenia conopsea* and *Dactylorchis fuchsii* were abundant in the same valley as was *Equisetum sylvaticum* (Wood Horsetail). *Cirsium heterophyllum* (Melancholy Thistle) was at its best, making a fine show all along the route. *Ribes alpinum* (Mountain currant) was plentiful about Foxup village, one bush of *Salix pentandra* was growing just above the village and a few plants of *Viola hirta* were noted, growing with *Helianthemum chamaecistus* (Rockrose) near Foxup beck. The hybrid grass *Festulolium* (*Festuca pratensis* x *Lolium perenne*) was abundant near Foxup village as was *Festuca arundinaceae* (Reed Fescue) also new to this 10 km. square.

Bryology (Mary Dalby): Miss Robertson was the only bryologist present at this meeting. She collected a number of interesting hepatics including: *Cololejeunea calcarea, Leiocolea muelleri, Reboulia hemisphaerica, Tritomaria quinquedentata, Metzgeria pubescens* and *Solenostoma cordifolium*. The mosses found included *Distichium capillaceum, Plagiopus oederi, Mnium seligeri, Neckera crispa, Philonotis calcarea* and *Tortella tortuosa*.

BRYOLOGICAL MEETING AT HEBDEN VALLEY AND HARDCASTLE CRAGS, V.C. 63, APRIL 19th 1969

F. E. BRANSON

We had long been looking forward to this meeting, the main object of which was to see the hepatic *Jubula hutchinsiae*, found here first in 1896 by the late James Needham, of Hebden Bridge. At the Y.N.U. meeting in 1904, William Ingham, who wrote the Bryological report said '. . . Mr. Needham, who knows the ground so well, proved an admirable guide to the habitats of many rare mosses.' We were also favoured with an excellent guide in Mr. F. Murgatroyd, knowing the area so intimately. He showed us the little stream running into the River Hebden where *Jubula hutchinsiae* was growing in the running water, totally immersed, mixed with a beautiful and graceful form of *Chiloscyphus polyanthos*. The *Jubula* could be distinguished by its rather bluish tint. The microscopical examination of this plant showed the leaves to be less spinous-dentate than is usual. The first person to discover this hepatic — in the South of Ireland, about 150 years ago — was Miss Ellen Hutchins (1785–1815), of whom it was said 'she could find anything'. If only there could be more about like her today! The plant was named in her honour by Dr. W. J. Hooker. We also found it in two sites nearby in the Hebden Valley. The only other record for Yorkshire is from Ravensgill, near Pateley Bridge (V.C. 64), recorded by Llewellyn J. Cocks in 1897, and last seen there in April 1950. It was thrilling to think of the associations of this area with the old botanists, it being a place favoured in the past by James Needham (1849–1913) of Hebden Bridge, and of John Nowell (1802–67) the working-man bryologist of Todmorden, and after whom Mitten named the hepatic *Nowellia curvifolia*, seen by us in two places, growing on rotten logs. A quite frequent moss, growing along the banks of the River Hebden was *Atrichum crispum* (James) Sull. (*Catharinea crispa* James), another association with Nowell. Crossland and Needham write in the Y.N.U. circular for the June 1904 excursion: '*Catherinia crispa*, first found in Europe in the Hebden Valley by J. Nowell, is abundant in and about the rocky streams.' Miss M. Dalby informs me that the date given in the records for this is 1860. It is interesting to see it here still over a hundred years later. One enigma of the Hebden Valley is that, in 1904 Mr. W. Ingham said that *Scapania subalpina* seemed to be the dominant liverwort. In 1917 another great hepaticologist, Wm. H. Pearson, visited this locality and wrote ('Hepatics of the Hebden Bridge Valley' — *Naturalist*, April 1918) — 'Mr. Broome and I searched carefully for *Scapania subalpina* Nees, but did not meet with it, although in the report on the visit of the Yorkshire Naturalists to Hebden Bridge in June 1904, it is referred to as the dominant liverwort of the Hebden Valley; all our specimens are *Scapania purpurascens* Hook.' On this day we saw neither of these species, the only *Scapania* collected being a little *S. undulata*. One of the greatest rarities recorded from Hardcastle Crags is *Lophozia atlantica* which we did not see on this occasion. This plant is also associated with James Needham, and I feel that I must quote the following incident from the Presidential Address to the Y.N.U., December 7th 1940, by the late Walter Watson, D.SC., A.L.S., entitled 'Yorkshire Associations, Lichenological or Otherwise.'

'. . . I recall one memorable September day in 1912, when, with some other botanists, Hebden Bridge was visited. We took Needham in a cab to Hardcastle Crags on one of the last expeditions he made. Needham was one of the working-men botanists whom we were more familiar with at that time than we are today. He had done much good work with the flowering plants and mosses, but, at the time of our visit, was more interested in fungi. What was supposed to be a new British liverwort, *Lophozia atlantica*, had been discovered at Hardcastle Crags, and we were desirous of seeing it. Needham knew where it had been found and was useful to us in pointing out the particular spot, but could not find the plant. Eventually it was located, a few scraps were taken for specimens, and we descended the slope of the hill. One of our party turned back to verify the particular characters of the slope where the plant occurred. As he was well-known to be rather too keen on collecting for distributing purposes, we all went back with him . . . I believe it was W. Ingham, of York, who had first found the plant . . .'

We proceeded about two miles up the Hebden Valley, a delighful rocky stream, bounded by woodland, and in places by steep, shaly cliffs, and which is quite unspoiled. Crossing over the river, and returning by road, past the cliffs known as Hardcastle Crags on the right, with a small limestone outcrop from the hillside on our left. This was also a very interesting area, and on the limestone cliff there were patches of *Zygodon viridissimus* var. *stirtonii*, a new location from that recorded by Mr. H. Walsh 'from the sand and limestone outcrop in Eaves Wood, Heptonstall'. Also in cracks in the cliffs was *Fissidens cristatus*. At least one vice-county record was made at this meeting (another is still awaiting confirmation), viz.: *Fissidens minutulus* var. *tenuifolius* on cliffs at the side of the river, made by myself. There was also a quantity of *Seligeria recurvata* c.fr. on the inside wall of the bridge at Gibson Mill and in several other places and, on sandstone cliffs in several places were patches of *Tetraphis browniana* with numerous capsules showing the four peristome teeth very clearly. *Dicranodontium denudatum* was in several places on tree roots and fallen trunks. Mr. Murgatroyd very kindly pointed out to me *Schistostega pennata* on loose soil under overhanging rocks on the roadside past Hardcastle Crags. This distinct moss (small, about a quarter of an inch high, or less) is impossible to mistake for any other because of the distichous, confluent leaves, which give it a frond-like appearance, much like a miniature fern such as *Blechnum spicant* (Hard Fern). A most striking character of this moss is the highly refractive character of the protonema, which shines with a bright green lustre when viewed from certain angles in the caves and dark holes in which it likes to grow. There are many other bryophytes which I should like to mention here, but enough has been said to show what an intensely interesting place is this delectable valley. The rest of the species seen on this occasion are found consolidated in the following lists.

I am most grateful to the following for examining material and expressing their views: Mrs. J. Appleyard, Mrs. J. Paton, Mr. J. H. Field, Mr. R. D. Fitzgerald, Mr. A. H. Norkett, Mr. E. C. Wallace, Mr. E. R. Little and Mr. M. Corley; and also to Mr. F. Murgatroyd for so ably leading the party.

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Nomenclature follows:
Census Catalogue of British Hepatics (4th edition) by J. A. Paton.
Census Catalogue of British Mosses (3rd edition) by E. F. Warburg.

Species found on the limestone outcrop are marked with an asterisk (*).

Musci

Sphagnum squarrosum
S. recurvum
S. fimbriatum
Atrichum crispum
A. undulatum
Polytrichum aloides
P. commune
Fissidens minutulus var. _tenuifolius_
F. taxifolius
*_F. cristatus_
F. adianthoides
Ceratodon purpureus var. _purpureus_
Seligeria recurvata
Blindia acuta var. _arenacea_
Dicranella heteromalla
Dicranum scoparium
Dicranodontium denudatum
Campylopus pyriformis
C. flexuosus
Encalypta streptocarpa
Tortula muralis
*_Barbula rigidula_
B. cylindrica
*_B. recurvirostra_
Gymnostomum aeruginosum
*_Tortella tortuosa_
*_Weissia controversa_
Leptodontium flexifolium
*_Grimmia apocarpa_
Rhacomitrium fasciculare
R. lanuginosum
Schistostega pennata
Tetraphis pellucida
T. browniana
Orthodontium lineare
Pohlia nutans
P. wahlenbergii
Bryum argenteum

MUSCI

*_B. capillare_
Mnium hornum
M. punctatum
Philonotis caespitosa
Amphidium mougeotii
*_Zygodon viridissimus_ var. _stirtonii_
Fontinalis antipyretica
F. squamosa
Hookeria lucens
*_Neckera crispa_
*_N. complanata_
Thamnium alopecurum
Heterocladium heteropterum
Thuidium tamariscinum
Cratoneuron commutatum var.
    commutatum
Amblystegium serpens
Acrocladium stramineum
A. cuspidatum
*_Camptothecium sericeum_
Brachythecium rutabulum
B. rivulare
*_B. velutinum_
B. populeum
Eurhynchium striatum
E. praelongum
E. swartzii
E. riparioides
Pseudoscleropodium purum
Isopterygium elegans
Plagiothecium succulentum
P. sylvaticum
P. undulatum
Hypnum cupressiforme
*_Ctenidium molluscum_
Hyocomium flagellare
Rhytidiadelphus squarrosus

HEPATICAE

Thalloid:

Conocephalum conicum
Riccardia sinuata
Pellia epiphylla
P. endiviifolia

Foliose:

Lepidozia reptans
Calypogeia muellerana
Lophozia ventricosa
Barbilophozia floerkei
B. attenuata
Gymnocolea inflata
Solenostoma triste
S. sphaerocarpum
Nardia compressa
N. scalaris
Plagiochila asplenioides var.
    asplenioides
Lophocolea bidentata
L. heterophylla
Chiloscyphus polyanthos
Cephalozia bicuspidata
Nowellia curvifolia
Diplophyllum albicans
Scapania undulata
*_Lejeunea cavifolia_
Jubula hutchinsiae

A Bryophyte Check-List for Lincolnshire by **M. R. D. Seaward.** Pp. 15. Lincolnshire Naturalists' Union 5/– post free. Obtainable from Mr. D. N. Robinson, 160 Eastgate, Louth, Lincs.

Mr. Seaward's excellently produced and modestly priced check-list will be invaluable to any bryologist working on the flora of the county of Lincolnshire. The check-list follows the pattern set by Peacock in his 'Check-List of Lincolnshire Plants' (_Lincs. Nat. Union Trans._, 1909). Lincolnshire consists of two vice-counties (V.C. 53 and V.C. 54) and for recording purposes these vice-counties are further subdivided into 6 and 12 divisions respectively. The bibliography and other lists of relevant data are very complete, and it is useful to have all these references together in one publication.

The whole work shows every evidence of very careful preparation and can be thoroughly recommended to all bryologists interested in county lists. G.A.S.

BOOK REVIEWS

Flora of Derbyshire edited by **A. R. Clapham.** Pp. viii + 382 with 17 photographs, 10 figures and 17 distribution maps. Derby Museum and Art Gallery. 45/–

Active interest in regional systematic botany remains as strong as ever in Britain and several new or revised county Floras have appeared in recent years. W. R. Linton's *Flora of Derbyshire* was published sixty-six years ago and much field-work has been done in the intervening years resulting in such a substantial accumulation of facts as to require an entirely new Flora rather than a supplementary list of records. The present work was initiated by a committee which first met twenty years ago and the completion and publication of the work is a notable example of effective co-ordination of field, library and herbarium work of a team of contributors under expert guidance and editorship.

A feature of particular botanical interest which Derbyshire shares with Yorkshire is its position as a meeting ground for northern and southern species. Despite its much smaller area it is geologically diversified and this is reflected in the richness of its flora. About one quarter of the book is occupied by introductory chapters giving detailed information on the geology, geomorphology, climate, and vegetation of the county contributed by W. H. Wilcockson, Prof. R. S. Waters, Prof. Alice Garnett and Dr. T. T. Elkington respectively. The chapter on vegetation includes 84 habitat studies giving detailed information on the composition of the flora in selected habitats characteristic of the magnesian limestone, coal measures, millstone grit, carboniferous limestone and the triassic and alluvial deposits of the southern lowland regions. A further chapter on geographical distribution by Dr. Elkington includes distribution maps of seventeen selected species and the volume is further enhanced by seventeen excellent photographs of species and scenic features.

In the floristic part of the work one kilometre (four-figure) grid references are given for each station save for the generally distributed species where absence in any 10 km. square is noted. Such recording is more precise yet more economical in space than traditional methods. For each species also, records are appended from Linton's Flora — with 10 km. references added to each locality — and this permits some comparison of past and present occurrence and distribution. There is a further notable improvement on the earlier work in the much more accurate habitat data given for most species, often supplemented for the more interesting species such as *Polemonium caeruleum* and *Vaccinium intermedium* by ecological data and information about characteristic associated species. All records for aliens and casuals are included and these are not distinguished typographically from native species. The accounts of the genera *Rubus, Hieracium* and *Euphrasia* have each been revised by the appropriate specialist.

It is a pleasure to welcome this excellent addition to the series of county Floras. Not only is the valuable store of information which it contains up-to-date, but the manner in which this information is assembled and made available is in line with the best modern trends in the production of such a work. W.A.S.

Drawings of British Plants: Part 26 by **Stella Ross-Craig.** Bell and Sons Ltd. 16/–.

The latest part of Stella Ross-Craig's great undertaking contains forty-eight plates covering the seven families Polygonaceae, Thymelaeaceae, Elaeagnaceae, Loranthaceae, Santalaceae, Euphorbiaceae and Buxaceae. Since four of these families are represented in Britain by single species the interest of this part centres mainly round the illustrations of Polygonums, Docks and Spurges. As always, her drawings combine accuracy with elegance and give aesthetic satisfaction as well as detailed information about the plants portrayed. The drawings of the fruiting perianths of the Docks, whole and in sectional view, and the enlarged cyathea, fruits and seeds of the Spurges are especially valuable for purposes of identification. The illustrations of whole plants of Docks, reduced to one eighteenth of natural size, leave little scope however for conveying the individuality of the species. Following the illustration of Knot grass, *Polygonum aviculare*, mention is made of three other 'variants of this species'. All three are treated as distinct species in *Flora Europaea* and their claims to recognition are scarcely less sound than those of some Salicornias illustrated in the previous part. The illustration of *Polygonum hydropiper* also does not show the characteristically nodding inflorescence of this species. These are small points however to set against the high standard of these drawings and all botanists will wish the artist a smooth and uninterrupted passage over the remainder of her long and exacting journey. W.A.S.

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